WEST AUSTRALIAN ORCHIDS.

Libr.- J.H.WILLIS

W. H. Nicholls

From B. T. Goadby
Western Australia

with Compliment & good wishes

2 March 1932

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West Australian Orchids

by

EMILY H. PELLOE

Author of

"WILDFLOWERS OF WESTERN AUSTRALIA"

Do they say that the bush is all greyness and gloom?
Why, the rainbow has lent every thread from his loom
To weave into flower and shrub!

There are star-flowers blue as the deep winter sky,
Here are "Grandmother's Honeycups," humble and shy;
And the purple of hovea bloom.

Half hiding, half peeping, the orchids appear,
The friendly and cheerful red runner creeps near—
Say, where are the greyness and gloom?

—LILIAN WOOSTER GREAVES.

[ILLUSTRATIONS BY THE AUTHOR]

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EMILY H. PELLOE
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To

SIR FRANCIS NEWDEGATE, K.C.M.G.,

Late Governor of Western Australia,

and Lover of its Flora.

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West Australian Orchids

Orchids are usually termed the aristocrats of plant life. The presence of over 130 species in Western Australia adds considerable interest to the study of her magnificent and world-famous flora.

The order or family *Orchidaceæ* was originally defined by Haller in the 18th Century, its name being adapted from the root of *Orchis,* a well-known genus in the temperate regions of the Northern hemisphere. It belongs to the group of plants known as monocotyledons, which have seeds generating in a single lobe, and with few exceptions, parallel-veined leaves. The *Orchidaceæ* family is a very large one, represented in the world by over 400 genera and many thousands of species, especially abundant in the Tropics, and rare in the Arctic regions.

West Australian orchids, which are practically all terrestrial, cannot be compared to some found in Brazil, the Malay States, India, and other tropical places, for size, vividness of colour, and bizarre marking. But their delicate tints, dainty fragility of form, the curious structure of many of the species, and their methods of fertilisation, constitute beauty that endears them to young and old, and characteristics that fascinate the botanist.

A tropical South American orchid (*Coryanthes, Hooker,* four species) has the honour of being considered the most wonderful flower in the world. It is an epiphyte (which means that it grows attached to the trunk or branches of a tree without being parasitical, or on a rock-face, but never in the ground) and has pendulous flowers marvellously constructed for the purpose of ensuring fertilisation by insects. Below a part composed of succulent tissue very attractive to bees, is a bucket-like organ kept full of a thin watery fluid that drips into it. The bees fight for places to secure the succulent tissue, and every now and then one falls, or gets pushed off, into the bucket. It can neither fly nor climb out and is forced to squeeze through a sort of narrow overflow pipe. In so doing it passes the stigma, fertilising it if any pollen is borne, and then, passing the anther, is loaded with a fresh supply of pollen to be carried on to other flowers.

Stanhopea, Frost, another tropical American epiphyte, also has flowers of wonderful construction and large size, some being eight inches in diameter. In one species (*S. tigrina, Bateman*) a certain part, the only escape from a bucket-like trap covered with juicy hairs is so slippery that fertilisation is effected by bees sliding down it on to the column. These and other magnificent tropical orchids grown under cultivation in Europe, are illustrated in colour in a French book entitled "Les Orchidees," by E. de Puydt.

Pterostylis, an Australian genus well represented in Western Australia, was specially mentioned by Darwin on account of the curious construction of its flowers and interesting methods of fertilisation, in his book, "The Fertilisation of Orchids."

NAMING AND CLASSIFICATION

Orchids, like all other classified plants, have two names. The first, usually of Greek derivation, denotes the genus to which it belongs, and the second, generally a Latin word, the species. In some cases personal names commemorating distinguished botanists and others have been used, but the names, when translated, usually indicate some characteristic of the genus or species. "Why not simple English names?" is a question often asked that can be best explained, perhaps, by mentioning the fact that science knows no nationality. A great deal of West Australian botanical collection, research and classification, has been done by foreign enthusiasts. It is a good thing the custom exists of using a common dead language such as Greek or Latin, for purposes of scientific nomenclature. Otherwise, we should indeed have been saddled with some puzzles in connection with the naming of our native flowers.

The name written immediately after an orchid or other classified flower, is that of the botanist who originally named it. It will be noticed that the majority of West Australian orchids owe their titles to Robert Brown, the "grand old man" of Australian botany. Originally an army surgeon, he was appointed by Sir Joseph Banks to accompany Flinders, as naturalist, on his voyage of discovery to Australia in the "Investigator." Robert Brown was subsequently Keeper of Botany at the British Museum, and is honoured as the greatest systematic botanist of all time.

Several genera and many species of orchids were named by Professor John Lindley, a celebrated English botanist, for many years a deeply interested worker on Australian plants.

Other famous botanists responsible for the naming of numerous species were George Bentham, author of "Flora Australiensis," a comprehensive work on Australian plants; Baron Ferdinand von Mueller, botanical explorer and writer, for many years Government Botanist of Victoria; and R. D. Fitzgerald, who wrote and illustrated in colour a priceless work on Australian orchids. Mr. Fitzgerald died, unfortunately, before his task was finished. A large number of his unpublished drawings are stored at the Mitchell Library, Sydney, New South Wales. Apart from the beautiful full-page plates, lucid descriptions and field notes of the varieties dealt with in the two volumes of "Fitzgerald's Australian Orchids," fascinating facts and theories concerning their fertilisation are included.

Dr. R. S. Rogers, of Adelaide, South Australia, is the present-day authority on Australian orchids. Besides describing many new West Australian species, Dr. Rogers has contributed much valuable information, based on personal knowledge of the living plants, through the medium of various botanical publications, dealing with other West Australian orchids, both well-known and rarely collected.

Mrs. Edith Coleman, of Blackburn, Victoria, has made special study of West Australian orchids, and enjoys the honour of being the only woman to describe and name new orchid species in Western Australia. Mrs. Coleman has contributed valuable addition to the known facts concerning the pollination of various species. Mr. O. H. Sargent, of Perth, also has specialised in orchid observation, and defined and named many species.

The common names by which many orchids are known are extremely interesting, but by no means satisfactory for identification purposes. The same name is often applied to several species, and in various places the same orchid is known by different names, which is confusing. The correct botanical names of most West Australian orchids are euphonious, and not too difficult for even children to learn. Once the meanings are understood and the described characteristics have been observed in the growing plants, the terrors of the names vanish, and their usage becomes a matter of course.

The following rules have been laid down for the correct spelling of botanical names: Generic names should always begin with a capital letter. A capital letter should be used for the name of a species derived from the name of a person. The termination "ii" is used with personal names (masculine) after all consonants except "r," e.g., *Menziesii, Muelleri;*

but not after vowels, e.g., *Purdiei.* The gender of an adjective species should agree with that of the generic name.

No absolutely authoritative ruling can be quoted for the proper pronunciation of the generic names of the various orchids, and it is surprising how many different ways some of them can be, and are, pronounced. In hope of something definite in this respect being adopted by West Australian orchid-lovers, the pronunciations commonly used by botanists are indicated in this book.

Classification of West Australian orchids, so far as genus is concerned, is not usually difficult. With a little practice, correct identification of the different species becomes easy if a book of reference is available, although examination of specimens under a lens is sometimes necessary. Pictures and detailed drawings are helpful, but to "run out," as botanists term working from detailed descriptions, is the most satisfactory way of arriving definitely at right identification. With the aid of this book it should not be beyond the power of any person or child of reasonable age, sufficiently interested, to learn to run out both genus and species of any West Australian orchid for themselves. The use of difficult technical terms has been avoided as much as possible. A glossary, however, is appended which explains the meaning of certain words considered necessary for concise and clear description. Idea can be obtained from the illustrations as to the genus of a specimen. If that genus be turned up and the general description found to agree, the details of the various species can be glanced through until one is discovered that corresponds in shape and colour, size of leaf, parts of flower, etc. To compare the descriptions of well-known varieties with living specimens is good practice for learning to deal with orchids not so well known.

STRUCTURE, FERTILISATION and REPRODUCTION

The chief characteristic of an orchid flower is the column, composed of the united male and female generative organs, stamens and pistil, and bearing upon it a small button-like projection known as the rostellum, covered, like the stigma, with a sticky glue-like substance attractive to insects.

Orchids are fertilised by pollen-grains falling from the anther on to the stigma, or being deposited upon it by pollen-bearing insects visiting the flower. Should the rostellum be touched by an insect (or even for purposes of experiment with a pin) the pollen masses are released from the anther at the top of the column. The column often bears wing-like,

semi-transparent appendages that assist in the direction of insects to the rostellum.

At the base of the column is the ovary or seed capsule. The perianth consists of three sepals, forming the outer row, and three petals alternate with them, forming the inner row, all adherent to the ovary. The sepals are usually darker outside than the petals. A distinctive feature of an orchid flower is that the third petal or labellum (commonly called the lip) is usually unlike the others, and of strange and unexpected shape. In many cases the lip has a part to play in assisting fertilisation by insects. Its appearance attracts them. The rows of calli or glandular hairs upon it in some species, guide crawling insects to the base of the column. When the lip is fringed, insects often get entangled, and their struggles for freedom generally result in pollen being deposited upon the stigma. In some instances the lip springs forward at the lightest touch, being provided with a hinge-like contrivance, so that insects alighting on the lip are forced against the column and held there.

Some orchids, owing to the arrangement of the generative parts, are capable of self-pollination, but the majority are dependent upon insects for fertilisation, the pollen usually being carried from other flowers. Those species that are self-fertilised always produce a far greater proportion of seed.

The seed-capsule of an orchid is three-celled, each cell containing a great number of tiny seeds. The quantity produced is counterbalanced by the fact that the seeds do not germinate freely, and the enormous number of flowers on varieties dependent on insects for reproduction, that bloom and wither without being fertilised.

Although orchids seed freely when fertilised, the reproduction of terrestrial species is largely carried on by multiplication of the root tubers, and for this reason an orchid plant should never be torn heedlessly from the ground. If the flower is carefully picked from above, or even just below the lower leaf or leaves, no damage is done and it will grow up again.

COLLECTION OF ORCHIDS

The study of orchids should appeal to any lover of Nature's beauty and wonders, and is one to be encouraged. Orchid-hunting is a delightful pastime entailing much healthful walking exercise, and adding unending charm to bush excursions. The interest of the beginner who has acquired some knowledge of species and habits, rapidly becomes the en-

thusiasm of the keen collector. And there is no doubt that the pursuit of Nature-study once cultivated by those lucky bush-dwellers with opportunity at their door-step, does much to relieve the monotony of country life.

"Live and let live," however, should be the motto of those orchid-seekers who strive to pick every flower on sight—a practice that can have but one result, the gradual but sure extermination of even the commonest kinds. Most children, and grown-ups also, have much to learn in this respect. Just a few carefully selected specimens in a loose bunch are ever so much more effective than hundreds of blooms tightly packed into a great mass than can scarcely be held in the hand. Orchids picked in this wholesale fashion usually are thrown away almost as soon as gathered or upon reaching home, because of their pitiable crushed and wilted condition, or the impossibility of using such quantities for decorative purpose in any one house. Quality and variety, not quantity, should be the aim of the orchid-hunter, also the opportunity of noting the characteristics of different species.

Children love orchids. They see quaint resemblances to something or other in almost every familiar variety. Perhaps because West Australian orchids mostly are plants of lowly stature, and the eyes of children are nearer the ground than those of grown-ups, boys and girls usually have what is known as "the orchid eye" exceedingly well developed, and are wonderfully quick at noticing species often unobserved by the casual passer-by.

A carefully prepared and properly classified orchid collection is of great interest. The specimens should be pressed by placing them carefully between sheets of blotting-paper as flat as possible and applying pressure with a hot iron. They should then be neatly mounted on a piece of stout white paper —not stuck on, but held in position by several narrow strips of adhesive paper—and labelled with the correct botanical name, colour, the common name or names by which known, locality where found, and the date. The various species should be grouped together under the headings of their respective genera, and the whole collection kept either in folders made of thick paper, or mounted on heavy paper and the sheets bound together by fine cord run through punched holes on the loose-leaf system, so that fresh specimens may be put away in their proper places as collected.

Systematic botanists are often compelled to rely solely upon dried specimens of plants from different lands for purposes of study and description. Bentham's monumental work, "Flora Australiensis," affords a striking example from a

classification point of view of what can be attained without personal knowledge of the flora of a country in its natural state. But no one interested, and fortunate enough to live within reach of the living and growing plants, should be content with such acquaintance with orchids. The observation of the growth and development of the various species from week to week, and year to year, is a fascinating hobby. Notes carefully kept with comparisons of various individual plants of the same variety growing under different conditions may yield valuable unrecorded information. It is in this way, for instance, that one becomes acquainted with the great change in the whole form of the plant which such a common orchid as *Pterostylis vittata* undergoes during the first three years of its growth. Many of the orchids in Western Australia, such as this one which grows readily from seed, are easily cultivated in boxes or pots and under such conditions can be studied at frequent intervals without difficulty. (See *Lyperanthus Forrestii,* page 41, and *Cryptostylis ovata,* page 64.)

WEST AUSTRALIAN TYPES

West Australian orchids, excepting those of the northern tropical area, are all terrestrial; that is, they grow in the ground. In the northern regions of Western Australia epiphytical and other tropical orchids have been found. Specimens in the Government herbariums from the Kimberley district, include *Eulophia venosa, Reichenbach fil; Cymbidium canaliculatum, R. Brown;* and *Dendrobium dicuphum, F. von Mueller.* The humid atmosphere of the tropical area of Western Australia is more favourable to the growth of epiphytes than the temperate regions of the southern portion of the State, where in the summer the rainfall is slight, and the moisture necessary for tree orchids dries out of the bark surrounding the trunks of forest trees. With the exception of one species of *Gastrodia* and perhaps the recently discovered *Rhizanthella,* all West Australian orchids belong to the tribe *Neottieæ,* in which the anther is erect or bent forward and persistent. Species of genera (including *Gastrodia*) belonging to the *Arethuseæ* tribe have the anther lid-like, incumbent, and usually deciduous.

LOCALITIES, ETC.

In the following pages descriptions will be found of the terrestrial orchids native to Western Australia. Localities, with month of flowering, have in almost every instance, been appended to each detailed description. But attempt has not been made to define exactly either the range, situation or

flowering period of the various species, as most of them are widely distributed and indifferent, apparently, to any particular class of soil. The places and times given, however, will serve as a guide for the collection of specially desired species. The majority of West Australian orchids thrive equally well in forest glades, river beds or swampy places, in the vicinity of flooded flats, sandy soil or on granite mountain ranges or coastal limestone hills. Flowering times vary according to situation, sometimes extending over several months.

Many orchids may be found upon the slopes of, or on the flats adjacent to the Darling Range. Some varieties are still fairly plentiful in and around Perth and suburbs on vacant virgin land, and in the vicinity of the upper reaches of the Swan and Canning rivers.

Thelymitra, R. & G. Forster

[thel-ee-my-tra]

From *thelys,* a woman, and *mitra,* a cap; referring to the hooded column which bears a fanciful resemblance to a woman's headdress.

Some of the most showy and beautiful of West Australian orchids belong to this genus, represented by many species, commonly called "Sun Orchids," with variously coloured flowers, often sweetly scented, in a terminal raceme. The flowers, unlike the usual orchid type, have sepals and petals nearly equal in length, with the lip similar to and spreading with them. This striking characteristic occurs among Australian orchids only in this genus. Many interesting experiments and observations were made and recorded by R. D. Fitzgerald in regard to the fertilisation of the various species of *Thelymitra* (some of which are capable of self-fertilisation while others are wholly dependent on insects) by artificial pollination with the aid of a pin, and the use of a bell-glass placed over a plant in the early stages of its development, thus precluding the possibility of insect fertilisation, and proving in many cases, the presence of the power of self-fertilisation. Various species produced seed when crossed artificially among themselves, and with the various forms of *Diuris.* The column is erect, rather short, and very broadly winged. Where the anther rises above the stigma, and the pollen masses crumble readily and fall on the stigma, the flower is usually capable of self-fertilisation. Some species fertilise themselves in the bud, the flower afterwards expanding. Where the pollen masses are not easily broken and come away readily at a touch, but whole, from behind or below the stigma, insects are necessary for fertilisation. The various species have a solitary leaf, usually with a long sheath.

The genus *Thelymitra* is principally Australian, but extends to New Zealand, New Caledonia and Java.

T. ixioides, Swartz; flowers like Ixia.

Usually above 1 ft., with several reddish-purple flowers, darkly veined. Middle lobe of hood crested at the top. "A type of the species in which the pollen masses are not friable but come away whole from behind the stigma, or the pollen in any way overlap it, or be overlapped by it, or crumble upon it."—Fitzgerald.

W.A.: Bibra Lakes, Busselton, Gilgerring, Lake Yangebup, Maylands, Pinjarra. September-October. Canning River

All other States.

T. canaliculata, R. Brown; channeled.

A species with habit and few, rather small flowers resembling the slender, narrow-leaved forms of *T. ixioides,* but the central lobe of column-hood is broader and though much more toothed, has no dorsal crest. Flowers bright blue with dark blue longitudinal lines; points of lateral wings of column produced forward into a bunch of light pink hairs, middle lobe toothed. Leaf, long, linear, deeply channeled. Usually favours clay soil.

W.A.: Albany, Bruce Rock, Dumbleyung, York. October-November.

Victoria, New South Wales.

T. campanulata, Lindley; bell-shaped.

A species considered distinct by some botanists, but not by Bentham, who could not separate it from *T. canaliculata.* As originally described, the leaf is radical and linear. Flowers numerous, reddish-purple, bell-shaped. Column-hood with wide appendages and sharp-pointed apex barbed at middle, softly hairy at the back.

W.A.: Mt. Toolbrunup. October.

T. crinita, Lindley; hairy, referring to the tufted crest of column.

Usually above 1 ft. high. Leaf very broadly lanceolate. Flowers, several in a loose raceme, of a beautiful shade of blue. Easily distinguished from other species by the hood of the column being densely crested. The wings enclose the column on three sides and terminate above in a dense tuft of purple hairs projecting forward. "Evidently fertilised by insects from the readiness with which pollen masses are removed from the anther, and their unbroken condition when extracted."—Fitzgerald. Favours ironstone hills.

W.A.: Albany, Bruce Rock, Dumbleyung, Gosnells, Jarnadup, Jarrahdale, Kalamunda, Narrogin, Stirling Range, Swan View, Warren River, Weld River, Yallingup. September-December.

T. fasciculata, Fitzgerald; arranged in a bundle.

A species somewhat resembling *T. canaliculata* and *T. ixioides.* Leaf linear, $\frac{1}{4}$ in. to $\frac{3}{4}$ in. long. Flowers lilac-blue, about five in a raceme . Column with pointed lobes or appendages and having no lobes or crest between them, but top of column covered by a mass of glands like a bundle of twigs.

W.A.: Albany, Busselton, Swan View. September-October.

T. aristata, Lindley; bearded, referring to the hair-tufts.

A tall robust plant. Leaf broad, about 7 in. long. Flowers several, pale mauve; hood of column smooth at back, middle lobe dilated, its crest level with the white hair-tufts.

W.A.: Maylands, Stirling Range, Swan View. September-October.

New South Wales, South Australia, Tasmania, Victoria.

T. longifolia, Forster; long leaf.

Usually slender with a long narrow leaf. Flowers light purple. Middle lobe of column hood scarcely notched and entire, smooth, dark yellow and tubular in form. Points of lateral lobes of column densely fringed with white hairs. The several flowers, every one of which produces seed, are self-fertilised before opening, and only open about noon for a little while on calm sunny days.

W.A.: Darlington, Dumbleyung, Highbury, Jarnadup, Kalamunda, Katanning, Narrogin, Swan View, Wagin, York. September-November.

All other States.

T. nuda, R. Brown; naked.

An intermediate species between the forms of *Thelymitra* that are independent, and those that are dependent upon insects for fertilisation. Stem about 18 in. Leaf about 7 in. long. Flowers, pale mauve, as many as 12 or 13 in a spike. Not considered distinct from *T. longifolia* by Bentham.

W.A.: Albany. September.

New South Wales.

T. pauciflora, R. Brown; few-flowered.

A single-flowered (blue) variety, somewhat resembling *T. longifolia,* but having the hood of column deeply divided. Not considered distinct by Bentham.

W.A.: Albany. September.

New South Wales, Victoria.

T. mucida, Fitzgerald; mouldy.

A slender species, scarcely 1 ft. high. Leaf linear, about 6in. long, thick but slightly channeled. Flowers, two or three, blue; petals and sepals about $\frac{1}{4}$ in. long. Column shorter and of a squarer form than in other species, hooded, the hood deeply and acutely emarginate with entire edges, very dark, but covered with a heavy bloom resembling mildew, which rubs off. Extreme lateral appendages produced horizontally,

covered on the outside with yellow cilia, smooth on the inside. This orchid was found by Fitzgerald at Wilson's Inlet in September, on a plain in standing water in company with *Microtis atrata,* and he considered it a self-fertilising species.

W.A.: Wilson's Inlet. September.

T. villosa, Lindley; hairy.

"CUSTARD ORCHID"

A rather stout species, usually above 1 ft. high, remarkable for its ovate leaf, hairy on both sides as well as the sheath, the rest of the plant being glabrous. Hairs on leaf run in longitudinal lines parallel to the margins. Flowers, large, yellow dotted with purple, in a loose raceme; middle lobe of the hood undivided, crested at the end, and a transverse crest inside the base. Lateral lobes of column densely fringed with orange-yellow hairs projecting forward.

W.A.: Busselton, Darlington, Gosnells, Harvey, Highbury, Kalamunda, Stirling Range, Swan View. September-October.

T. tigrina, R. Brown; tiger-like markings.

A slender plant. Leaf very narrow, glabrous and channeled. Flowers, small, yellow, spotted. Sepals and petals under ½ in. long. Middle lobe of hood divided three times, without internal crest.

W.A.: Albany, Dalwallinu. November.

T. Sargentii, Rogers; honouring O. H. Sargent, of Perth, W.A.

A slender plant, up to 16 in., with a loose cylindrical sheath at base of stem about 2 in. long. Leaf lanceolate, acuminate, sheathing at base, reaching beyond the middle of the scape. Raceme loosely flowered, from 4 to 5½ in. long. Flowers, 10 to 14, rather large for the genus., yellow with brown dots, resembling those of *T. fuscolutea.* Perianth segments spreading or suberect. Column elongated erect, yellow, spotted, rather widely winged, produced high above the anther, three-lobed at the apex, middle lobe incurved, not crested on the back, deeply emarginate, the border otherwise entire, lateral lobes ascending, densely bearded. (Described Transactions Royal Society S.A., Vol. LIV., 1930.)

W.A.: Bencubbin, Bruce Rock, Dalwallinu. October.

T. stellata, Lindley; star-like.

A stout species, 1 to 1½ ft., closely allied to *T. fuscolutea.* Flowers, yellow; sepals and petals narrow-lanceolate. Column-hood deeply fringed with linear lobes, with a club-shaped

appendage on the back. Dorsal appendage of the hood crested at the end.

W.A.: Armadale, King's Park, Perth, Jarnadup, Warren River. October-January.

T. fuscolutea, R. Brown; brown and yellow-flowered.

"ORANGE ORCHID" "SPOTTED ORCHID"

A stout glabrous plant of 1 to 1½ ft.. Leaf ovate or oblong-lanceolate, 2 to 4 in. long. Flowers, very sweetly scented, large, in a terminal raceme, yellow, spotted with brown; sepals and petals broadly lanceolate. Dorsal appendage of the hood of column smooth, tubercular and notched at the end.

W.A.: Albany, Darlington, Dumbleyung, Gosnells, Jarnadup, Jarrahdade, Manjimup, Stirling Range, Swan View, York. September-December.

T. flexuosa, Endlicher; undulating.

Stems slender, under 1 ft., wiry and flexuose, bending almost at right angles to the leaf and at each of the bracts. Flowers, smaller than other species; one to four, yellow, suffused with red on the outside. Sepals and petals obtuse, about ¼ in. long. Column-wing broadly truncate, slightly sinuate, but the lobes scarcely prominent. Usually found growing on wet flats.

W.A.: Albany, Helena Vale, Midland Junction, Mundaring, Pindalup, Pinjarra, Ravenswood. September-October.

T. antennifera, Hooker; bearing feelers.

"CANARY ORCHID" "LEMON ORCHID"
"VANILLA ORCHID"

A small plant, stems erect, wiry, 6 in. to 1 ft. high, with narrow-linear, rather thick leaves. Flowers, one, two or three; yellow, sepals suffused with red on the outside, delicately scented. Lateral lobes of the column reddish-brown, oblong, erect, spathulate. Fertilised by insects. A common species.

W.A.: Albany, Lesmurdie, Mundaring, Perth, Waroona, York. August-October.

South Australia, Tasmania, Victoria.

T. psammophila, Andrews; sand-loving.

Stem 5 to 8 in. high, slightly flexuose. Leaf narrow-linear, 1½ to 3 in. long, empty bracts two or three, leaflike, ½ in. long. Flowers, 2 to 4, sepals and petals ovate, more or less acuminate, to nearly ½ in. long, yellow. Column-wing continued behind, but shorter than the anther, with a broad rounded

middle-lobe and narrow triangular lateral lobes, dark reddish-brown in colour. No red colouring on outside of sepals. (Described Journal W.A. Natural History Society, May, 1905.) Favours sand plains.

W.A.: Stirling Range, Upper Kalgan River. October.

T. carnea, R. Brown; flesh-coloured.

A slender species from 6 to 9 in. high. Leaf narrow, channeled. Flowers, one to three, small, pink to bright red, opening only in the sun. Column wings produced laterally into two denticulate and more or less roughened yellow horizontal lobes not bearing hair tufts. Intermediate lobe broad, reddish, slightly denticulate, and rather higher.

W.A.: Rarely Collected.

T. Macmillanii, F. von Mueller; honouring Thomas Macmillan.

A dwarf species, about 6 in. high, leaf narrow-linear, channeled, bract-like, dark green and smooth. Stem rigid, undulate and smooth. Flowers, two or three, salmon pink, petals and sepals spreading, faintly veined, lip slightly shorter. Column wings produced upwards into two tall yellow points with crested surface and margins. A rare species.

W.A.: Highbury. October.
South Australia, Victoria.

T. variegata, Lindley; variegated.

"LEOPARD ORCHID"

Stem 1 ft. high or more. Leaf often spirally twisted about the base of stem. Flowers 2 to 4, large, purple, spotted. Lateral lobes of column orange-coloured, hornlike, oblong, erect, curved, toothed. In a note accompanying his description of a new species, *Thelymitra d'Altonii*, Dr. Rogers states that this Victorian variety is "evidently a near relation of *T. spiralis, Lindl.*, and *T. variegata, Lindl.*, two ill-defined and possibly composite West Australian forms. . . . The name *variegata* implies a character (presumably in the flowers) which receives no reference in either of the original descriptions." (Transactions Royal Society of S.A., Vol. LIV., 1930). Dr. Rogers adds that Bentham retained only *T. variegata*, expressing doubt as to the wisdom of uniting these species, a point to be settled only after examination of a plentiful supply of material.

W.A.: Applecross, Canning Bridge, Gosnells, Northam, South Perth, Wanneroo, Warren River. August-December.

Epiblema, R. Brown

[ep-ee-blee-mer]

From *epi,* upon, and *ballein,* to lay or throw.

A West Australian genus resembling *Thelymitra,* but having a clawed lip, limited to a single species.

E. grandiflorum, R. Brown; large-flowered.

A plant 1 to 1½ ft. high, with the habit of the slender forms of *Thelymitra ixioides,* one long narrow-linear leaf and 1 or 2 smaller erect leaves or sheathing scales. Flowers, purplish-blue, 2 to 5, in a short raceme, sepals and petals to ¾ in. long, broadly oblong-lanceolate, veined like *T. ixioides,* all nearly similar. Lip on a short claw. Lateral appendages of the column-hood oblique. Favours swampy flats.

W.A.: Albany, Balbarrup, Bayswater, Granite Bar. November-March.

Diuris, Smith

[die-you-riss]

From *dis,* double, and *oura,* a tail; referring to the two lower sepals of the flowers.

An Australian genus known as "Double-tails." The best known species in Western Australia is commonly called "Donkey Orchid." Other species of the genus can easily be identified by their resemblance to it in type of flower. Typical characteristics of the genus are the narrow leaves, few at or near the base of the stem, with a few sheathing bracts higher up, the curiously shaped flowers—one, two, or several—in a terminal raceme, the upper sepal short and broad, the two lower sepals narrow and curved, the two upper petals battledore shaped, with the lip deeply three-lobed, and total dependance on insects for fertilisation. Fitzgerald observed that from the compact nature of the pollen masses and the readiness with which they may be moved by the slightest touch of the rostellum, they must be most frequently fertilised by the pollen from other flowers. He noticed an affinity in stigma, rostellum and anther, to *Thelymitra ixioides,* and produced seed by crossings between this species and *Diuris.* Many botanists disagree with Bentham's arrangement of the genus, and consider that he has grouped species in some instances that should have been kept distinct.

D. laevis, Fitzgerald; smooth.

A slender species, 8 in. to 1 ft. high. Leaves from 3 to 6 in. long, numerous, spirally twisted, enclosed at the base by a sheath. Flowers, two to six, light yellow, petals elliptical,

about 1 in. long including the dark brown claw. Lateral sepals, linear, green. Upper sepal almost triangular, embracing the column, about half the length of the other sepals. Lip three-lobed, lateral lobes half the length of the central one, falcate and toothed along the upper edges, streaked with dark brown; central lobe ovate-rhomboid, linear at base, brown markings. Wings of column same length as column, toothed. (Described "Fitzgerald's Australian Orchids," Vol. 2.)

W.A.: Albany, Busselton, Gosnells, York. September-October.

D. Purdiei, Diels; honouring Alexander Purdie, M.A.

A small species 6 or 8 in. high. Leaves narrow-linear, 2½ to 3 in. long. Upper sepal shorter than the lateral petals, lateral sepals pointed, longer than the lip. Lateral petals with a long claw, elliptical, yellow with purple veins. Lip three-lobed, with two short raised lines, middle lobe large, almost rhomboid, much longer than the small half-ovate lateral lobes, which are deeply cleft on the outer side. Easily recognised by the narrow leaves and by the lip very different to other narrow-leaved *Diuris* species. (Described Journal Proceedings Mueller Botanical Society, April, 1903). Favours wet sandy flats.

W.A.: Bridgetown, Cannington, Pinjarra. October.

D. setacea, R. Brown; bristly.

Leaves 8 to 10, linear, spirally twisted. Flowers sulphur yellow. Lip with a single keel from base to apex, middle lobe somewhat spreading. (From description by O. H. Sargent, in Journal W.A. Natural History Society). Favours loam and clay soil.

W.A.: Albany, Dumbleyung, Jarrahdale, Katanning, Pindalup, Pinjarra. October-November.

Diuris setacea, R Brown
[~~Half—natural—size~~)

D. carinata, Lindley; keel-shaped, referring to the keel-like structure of parts of the flower.

"BEE ORCHID"

Leaves, four or five, awl-shaped.. Stem about 1 ft.

high. Flowers about ¼ in. wide and 1 in. long, yellow, with a purple spot at base and apex of upper sepal and petals. Lip with a double-keeled claw, middle lobe rather closely reduplicate, one-keeled. (From description by O. H. Sargent in Journal W.A. Natural History Society.) Favours swampy places and wet clayey flats.

W.A.: Busselton, Darling Range, Highbury, Katanning, Kojonup, Maddington, Pindalup, Toodyay, Wagin, York. September-October.

D. filifolia, Lindley; thread-like leaves.

This species and *D. carinata* were not considered distinct by Bentham from *D. setacea.* Dr. Diels (Journal Proceedings Mueller Botanical Society, April, 1903) states: "I am quite sure that these (*D. setacea, D. carinata,* and *D. filifolia*) are three different species resembling each other in foliage, but very different in flower. *D. carinata, Lindley,* I believe to be the shorter, stouter plant found in the Darling Range near Perth." Lindley's original description states that the stem is much shorter than the sharp-pointed leaves, flowers yellow, labellum lobed at middle, almost round at base, and one-keeled. This species is not recognised as distinct by Dr. Rogers from *D. carinata.*

W.A.

D. emarginata, R. Brown; notched at margin.

A species closely resembling *D. carinata,* but taller, stouter and larger flowered. Leaves semi-terete. Petals without spots, often emarginate. Middle lobe of lip somewhat spreading. "Both this species and *D. carinata* inhabit swampy places and flower in October. They often occur together when intermediate forms, which I think must be hybrids, are found among them." (Description and note by O. H. Sargent, Journal W.A. Natural History Society.)

W.A.: Albany, Harvey, Vasse River, York. October.

D. longifolia, R. Brown; long leaf.

"DAMSEL ORCHID" "DINGO ORCHID" "PANSY ORCHID" "DONKEY ORCHID"

From under 1 ft. high to considerably more. Leaves linear, narrow or broad, one usually very long. Flowers, three to five, occasionally more, variable in size, yellow and brown, sometimes heavily suffused with purple, when the resemblance to a pansy is marked. The two upper petals are often ¾ in. or more long, erect, and are supposed to be like the ears

of a donkey, lower sepals as long, linear or dilated above the middle. Upper sepal short and very broad. Lip three-lobed from the base, lateral lobes nearly as long as the middle one, middle lobe contracted into a claw at base, with a fairly prominent line along the centre. A common species favouring all conditions of soil and situation.

W.A.: Widely distributed.
New South Wales, South Australia, Tasmania, Victoria.

D. pauciflora, R. Brown; few-flowered.

A slender plant, 6 in. to 1 ft. high. Leaves very narrow. Flowers, one to three, yellow and purple. Petals ovate, about ½ in. long, including the very short claw, lateral sepals not reflexed, linear, but rather broader than in most species. Upper sepal shorter. Lip three-lobed from the base, lateral lobes not half as long as middle lobe, with a slight central raised line not half the length of lip. Favours wet sandy flats.

W.A.: Albany, Kalamunda, Mt. Barker. October-November.

Microtis, R. Brown

[my-krow-tiss]

From *mikros,* small, and *ous, otos,* an ear; referring to the appearance of the anthers.

A genus commonly called "Mignonette Orchids" in Western Australia, and somewhat similar to *Prasophyllum* in habit, but easily distinguished from it by the smaller flowers numerous on a terminal spike, which are usually greenish and not reversed. The stigma is enclosed within a hood formed by the lateral appendages of the column. Fertilisation is performed by insects, which, by touching the very small and sensitive rostellum, cause the pollen either to fall and adhere to the stigma, or be carried by them to another flower. Like *Prasophyllum,* species are considered difficult to identify.

The genus *Microtis* extends to New Zealand and also to New Caledonia, Java, Formosa, Philippines, Japan and Southern China. Seven of the nine Australian species are endemic.

M. porrifolia, Sprengel; leek-leaved.

A tall, stout species over 1 ft. high, with a long leaf and dense spike of small greenish flowers. Lateral petals relatively wide, oblong-oval, much shorter than the recurved

lateral sepals, upper sepal wide, concave. Lip with three callosities on the disk, notched at tip, the margin usually crisped.

W.A.: Albany, Darlington, Swan View. October.
All other Australian States.

M. truncata, Rogers; truncate, referring to shape of lip.

A plant of slender habit. Spike about 8½ in. long, bearing about 40 distant flowers. Flowers light-coloured, on short stalks, subtended by a small awl-like bract reaching a little above the base of the much twisted ovary. Petals linear-falcate, as long as lateral sepals, which are recurved or rolled back in mature flowers, upper sepal broad; lip truncate with three well-defined callosities, two at the base and one in the middle extending almost to the tip. (Described Transactions and Proceedings Royal Society S.A., XLIV., 1920.)

W.A.: Albany, Greenbushes, Jarnadup. December.

M. parviflora, R. Brown; small-flowered.

A slender plant about 3 in. high. Leaf-lamina leek-like, usually much exceeding the inflorescence. Flowers green, on short stalks, smaller than those of *M. porrifolia,* commonly in a fairly dense spike, but the latter often attenuated. Lateral sepals recurved or revolute in the mature flower. Lip entire, with two well-defined callosities at base, none at tip.

W.A.
All other Australian States.

M. media, R. Brown; intermediate.

A tall species, leaf narrow, flowers white, much recurved, lip notched at tip, with two definite lateral basal callosities.

W.A.: Albany, Jarnadup, Pinjarra, York. September-December.

M. alba, R. Brown; white.

Stems often above 1 ft. high. Leaf with a long sheath, the blade often exceeding the spike. Flowers numerous, much incurved, white, in a sometimes very dense spike. Lateral sepals rolled back. Upper sepal acuminate, contracted at the base. Lip broadly two-lobed, the margins wavy or fringed. Favours all varieties of soil.

W.A.: Albany, Cannington, Dumbleyung, Greenbushes, Harvey, Jarnadup, Jarrahdale, Mandurah, Pindalup, Stirling Range, York. October-December.

M. orbicularis, Rogers; disk-shaped labellum.

Stem rush-like, up to about 12 in., leaf sometimes longer, sometimes shorter than the spike. Spike, rising at a slight angle to the stem, not crowded and with a flatter appearance than in other species of the genus. Flowers, light green, minute, sessile. Dorsal sepal forms an obtuse hood over the column, lateral sepals about the same length or shorter than dorsal sepal, shorter than lip and hidden by it. Lateral petals very minute and spreading, points curving backwards. Lip broad and obtuse, projecting downwards. Column very small, with distinct linear auricles. Favours swampy ground.

W.A.: Bellevue, Cannington, Highbury, Pindalup. October.
South Australia.

M. atrata, Lindley; blackened, referring to the specimens drying black.

A minute species. Leaf short but with the long sheath reaching almost to the tiny flowers in a rather dense spike of ½ to 1 in., lateral sepals very blunt, not hidden, spreading, not recurved or revolute, upper sepal broad, lip broad, entire. Grows in wet places.

W.A.: Albany, Gosnells, Guildford, Kalamunda, Midland Junction, Pindalup.
South Australia, Tasmania, Victoria.

M. pulchella, R. Brown; beautiful.

Stem slender, under 1 ft. Leaf narrow and short. Flower-spike not dense, rarely 2 in. long. Upper sepal blunt, not much broader than the spreading lateral sepals; petals incurved over column, same length but much narrower than lateral sepals.

W.A.: Swan View. September.

M. gymnadenoides, Diels; like Gymnadenia.

Stem slender with one basal scale, 10 to 18 in. high. Leaf rather long, the free part from 4 to 7 in. Spike rather long, narrow, cylindrical. Flowers white, upper sepal broad, ovate, concave, with a small point at the top; lateral sepals spreading, not recurved, rather blunt, much like the lateral petals, but a little broader. Lip crisped in the middle part, the disk marked by two small appendages, and bearing a small thickening towards the end. (Described Journal Proceedings Mueller Society, April, 1903). Note by Dr. Diels: "Collected close to Albany toward the north in wet, sandy flats. This

species seems to be related to *M. pulchella*. It is different, however, from Bentham's description, in the longer leaf, the dorsal sepal wider and more concave, the crisped margin of the labellum, and the larger flowers."

W.A.: Albany district. November.

Goadbyella, Rogers

[goad-be-ella]

Honouring Lt.-Colonel B. T. Goadby, a West Australian botanist and collector.

A genus most closely related to *Microtis,* but with flowers reversed, column more slender and elongated, dorsal sepal narrow and non-cucullate, and lateral sepals wide and truncate.

G. gracilis, Rogers; graceful.

A very slender plant with the leaf-blade reaching well above the base of the spike. Flowers reversed, numerous, greenish-yellow, small, rather distant and pedicellate below, much closer and sessile above. Dorsal sepal narrowly oblong, or ob-cuneate, very blunt at the apex, incurved over the column. Lateral sepals spreading below the lip, free, oblong, truncate; margins of the lower half entire, then wavy and fringed with calli, part of surface more or less ornamented with groups of calli, three-nerved. Petals erect, linear, slightly falcate, very blunt, one-nerved, nearly equal to the column. Lip sessile, basal margins entire, expanding into two somewhat rounded lobes with waved margins fringed with glandular calli; lamina three-nerved, with two raised parallel lines in the lower half and a group of glandular calli near the middle of expanded portion. Column somewhat slender, narrow and not winged below, expanded abruptly at the apex, auricles long and oblique, oblong with rounded apices. (Described Transactions Royal Society of S.A., LI., 1927.) Favours jarrah forest. Note by Dr. Rogers: "This plant forms an interesting link between *Prasophyllum* and *Microtis,* both of which it resembles in habit. From *Prasophyllum* it is readily distinguished by the shape of the labellum, and especially by a very different column. The lateral sepals of *Goadbyella* are broad truncate and very ornate, in striking contrast to the same segments in species of *Prasophyllum* and *Microtis.*"

W.A.: Pindalup. November.

Prasophyllum, R. Brown

[praise-o-fill-um]

From *prasos,* a leek, and *phyllos,* a leaf; referring to the leek-like leaves.

Species of this genus are commonly called "Leek Orchids." The genus is easily recognised by the sheathing leaf and spike of small inverted flowers, but many of the species are difficult to determine. The spikes of whitish flowers tinged or streaked with green and purple, are not specially attractive to the flower-hunter, yet the beauty of a single bloom when beheld through a magnifying-glass is amazing. The sepals and petals are narrow and inconspicuous. The lip on the upper side of the flower is broad and slightly waved at the edge, often bearing an inner plate. The column is very short.

The various species of *Prasophyllum* are wholly dependent on insects for fertilisation, and there is a marked difference in the number fertilised according to situation. Sometimes solitary plants will not have a single flower fertilised, yet when growing in groups, generally in a rushy flat—perhaps the haunt of some particular insect—every flower on every plant will be fertilised. Hybridisation of different species is common and no doubt responsible for specimens that have been collected bearing flowers on the same spike having characteristics of species so different as to have been placed by Bentham in separate sections dividing those with a rigid sessile lip from others having the lip on a short claw.

P. australe, R. Brown; southern.

Often slender, usually over 1 ft. in height. Leaf-blade usually shorter than the spike. Flowers, sessile in a rather loose spike, sweet-scented, with prevailing tints of white, brown and green. Perianth segments all very acute, sepals nearly equal in length, the dorsal one erect or recurved, concave, ovate-lanceolate, the lateral ones sometimes free at extreme base, and united beyond almost to the tips. Petals erect, yellowish-green with wide reddish-brown stripe down the centre, narrower and rather shorter than the lateral sepals. Lip conspicuously white, callous part prominently raised, ending close to the bend, ovary long and very slender. An uncommon species.

W.A.

All Australian States. October-December.

P. elatum, R. Brown; tall.

"PIANO ORCHID"

This species is well named as it is one of the tallest terrestrial orchids in Australia. West Australian children see a

resemblance in the pearly white of the lip and the darkly streaked sepals and petals in the long spikes of closely set flowers to the black and white keys of a piano. The stem is sometimes 6 ft. high, with the long sheath covering a great part of it. Flowers largely white, often dusky, tinged with green and purple, nearly sessile in a spike of 4 to 8 in. or more. Lateral sepals united from about the middle almost to the tips, petals usually spreading. Lip as long as the petals, ovate-oblong, the margins wavy, and the inner plate occupying the greater part of its surface. Lateral appendages exceeding the column in height. A common species found in all classes of country.

W.A.: Widely distributed. September.
New South Wales, South Australia, Tasmania, Victoria.

P. Muelleri, Andrews; honouring F. von Mueller.

A tall plant, often 4 ft. in height, differing from *P. elatum* in that the lip instead of being sessile is hinged on a short claw. Lateral sepals often quite free. Favours stony ridges.

W.A.: Swan View. September.

P. regium, Rogers; king-like.

A robust plant up to 3½ ft. or more, leaf not reaching to top of flower-spike. Flowers white, tinged with green and purple, in a rather loose spike sometimes 16 in. long, composed of upwards of 50 flowers, with lower blossoms distant. Lip on a distinct claw, recurved at right angles, inner plate thin, membraneous, orbicular-lanceolate, margin entire, extending nearly to tip, no secondary plate. Lateral appendages of column exceeding rostellum in height. (Described Transactions Royal Society S.A., Vol. XLII., 1918.)

W.A.: Manjimup. December.

P. lanceolatum, Rogers; lanceolate, referring to the shape of perianth segments and lip.

A rather slender plant, about 18 in. high, with two long overlapping tubular sheaths at base of stem. Leaf-blade about 6 in. long, not reaching as high as spike. Spike about 6 in. long. Flowers rather distant, dark reddish-brown segments of perianth narrow-lanceolate, upper sepal nearly ½ in. long, slightly incurved, longer than lateral sepals. Lateral petals shorter. Lip on a very short claw, about ¼ in. long, lanceolate, membraneous border narrow, not crisped, margin entire, almost plain, inner plate relatively large, lanceolate, extending

to within a short distance of the apex. (Described Transactions and Proceedings Royal Society, S.A., XLIV., 1920.)

W.A.: Albany, Muresk, Perth. October.

P. ellipticum, Rogers; referring to shape of lip.

A tall, robust plant of about 3 ft. Spike rather crowded with numerous pale green flowers, nearly 1 ft. long. Leaf-blade not reaching to top of spike. Flowers sessile on a slender ovary. Perianth segments (excepting lip) rather narrow; lateral sepals about ½ in. long, upper sepal longer, lateral petals shorter. Lip on a very short claw, elliptical, about ¼ in. long and ¼ in. wide, erect at base, recurved towards the tip, outer membraneous margin white, wide and voluminous, much crisped; inner plate also membraneous, oval, with a rather blunt short apical projection commencing about the bend but not nearly reaching the tip, attached to outer plate at base and apical projection, margin otherwise free. Lateral appendages of column exceeding the rostellum in height. (Described Transactions and Proceedings Royal Society S.A., XLIV., 1920.)

W.A.: Jarnadup. December.

P. fimbria, Reichenbach fil; fringed.

A tall species with the habit and size of flowers of *P. elatum,* but with a very different lip. Flowers white, shaded with purple. Sepals nearly ½ in. long, petals shorter, linear. Lip as long as sepals, on a tiny but distinct narrow claw, upper part broad with fringed or crisped margins, inner plate ending above the middle in a broad, free, densely crisped margin, and within it in the centre of the lip, a more or less conspicuous second plate with scarcely prominent entire margins. Distribution general and common.

W.A.: Albany, Darlington, Jarnadup, Mundijong. September-December.

P. hians, Reichenbach; yawning.

Stem 4 in. to 2 ft. or more high, leaf-sheath loose. Flowers white, tinged with reddish-green or with purple markings, in rather a dense spike. Sepals over ¼ in. long, the lateral ones united almost to the apex, very thin and whitish near their line of junction; petals longer than lateral sepals, more dilated than in other species. Lip sessile, rather broad at base, but not swollen, recurved above the middle, margins wavy, the inner-plate much narrower, olive-green coloured, forming a longitudinal central thickening, ending at the bend

or a little beyond it, in a thick fringed callus. A common species.

W.A.: Widely distributed. October.

P. cyphochillum, Bentham; curved lip.

Stem 1 to 2 ft., leaf-blade short and slender. Flowers small, white tinged with reddish-purple, lip with a swollen base forming a short pouch protruding between the lateral sepals.

W.A.: Albany, Darling Range, Gosnells, Highbury, Perth, Pindalup, Wagin, Welshpool, York, Septaember.

Prasophyllum cyphochillum, Bentham, with enlarged sketch of lateral sepals and labellum.
[Half natural size]

P. ovale, Lindley; oval.

Stem slender, above 1 ft. high, leaf-sheath and blade long. Flowers small, white tinged with green and purple, in a spike of 3 to 6 in., not dense. Lateral sepals and petals linear, all nearly equal, upper sepal white, wider than other segments. Lip nearly as long as lateral sepals, oval, membraneous part white, with entire margins, slightly scalloped towards the tip, callous part smooth, green, triangular, extending from the base to slightly beyond the middle, shiny, glandular, much narrower than the membraneous part, not swollen at base. A common species.

W.A.: Albany, Darlington, Gosnells, Highbury, Kalamunda, Narrogin, Perth, Pindalup, Stirling Range, Wagin, York. September-October.

var. triglochin, Reichenbach fil; Rogers.

Note by Dr. Rogers: "Lateral petals 2.5 mm. long; sepals 3 mm. long; labellum oval or bluntly elliptical, 2.5 mm. long. The leaf of this species is stated by Bentham to have a long lamina. An examination of a large number of specimens in the field and herbarium indicate that the leaf-

lamina is almost invariably short as in the case of *P. cyphochilum.*"

W.A.: Lake Chockerup.

P. macrostachyum, R. Brown; long spike.

A slender plant; flowers, greenish-white, sometimes deep purple, rather distant in a long spike. Lateral sepals awl-shaped, twice as long as petals.

This orchid is occasionally found with the spike once-forked for about half its length, giving it a double-headed appearance.

A light green variety favours moist places in loamy clay soil, and dark purple flowered form is found on clay flats covered in winter months with standing water.

W.A.: Albany, Dumbleyung, Highbury, Katanning, Kojonup, Midland Junction, Narrogin, Pindalup, Swan View, Waddering, September-October.

Prasophyllum macrostachyum, R. Brown, with enlarged sketch of flower. [Half natural size]

P. attenuatum, Fitzgerald; attenuated.

A very slender, wiry species, 12 to 18 in. high, leaf 9 in., blade 3 in. Flowers about 40, not dense, on a spike of about 5 in. Lateral sepals not two lines, greenish with white edges, oblong, cucullate at the ends with blunt points. Dorsal sepal about 2 lines oblong, hardly acuminate, slightly recurved. Lip about 2 lines ovate-oblong, pouched at end. Disk about two-thirds length of lip, hardly raised above it, with five slight ridges towards the end. Lower lobe obtuse. (Described Gardener's Chronicle, XVII., pp. 495.)

W.A.: Bunbury. September.

P. plumaforme, Fitzgerald; feathery.

A slender species, 12 to 18 in. high. Leaf about 6 in., blade hardly 2 in. Flowers about 40 in a long feathery spike.

Sepals and petals oblong, acuminate, about 2 lines. Lateral sepals white with green stripes. Dorsal sepal red-brown edged with white. Petals white with purple stripe. Lateral sepals not united. Lip not curved, oblong, tapering, slightly reflexed for about one-third of its length, two parallel raised lines on the disc. Lateral appendages of column falcate, acuminate; unequally two-lobed. Rostellum slender, longer than the appendages, anther short, hardly acuminate. (Described Gardener's Chronicle, XVII., pp. 495.)

W.A.: Albany. August.

P. triangulare, Fitzgerald; triangular-shaped lip.

A rather robust species, 12 in. or more high, very dark coloured. Leaf about 10 in. long, blade about 5 in. Flowers dark red brown, about 30 in a long spike, lateral sepals united almost to their points, together ovate-acuminate, glandular at base and along joined edges. Dorsal sepal rather longer, about 3 lines. Petals lanceolate, shorter than sepals. Lip about 2 lines on a rather long claw, triangular, very slightly recurved, edges entire, slightly undulate, the disc forming a raised triangular plate nearly as large as lip, somewhat swollen towards the point and irregularly covered with small sessible calli. Appendages to column broad at base, falcate, acuminate, equal in length to rostellum, thickened on outer margin with three or more callosities. Anther much shorter than rostellum, hardly acuminate. (Described Gardener's Chronicle, XVII., pp. 495.)

W.A.: Albany. October.

P. parvifolium, Lindley; small-leaved.

Stem slender, 9 in. to over 1 ft. high, the leaf above the middle of the stem, with a short slender blade. Flowers white and green, faintly streaked with crimson, five seven or less, in a loose raceme of 2 or 3 in.

W.A.: Albany, Bayswater, Busselton, Greenmount, Kalamunda, Muresk Swan View. June-September.

Prasophyllum parvifolium, Lindley [Half natural size]

P. gibbosum, R. Brown; curved.

Stems from under 6 in. to 1 ft., leaf-sheath long, with a long narrow-linear blade. Flowers in a rather dense spike, sepals and petals obtuse. Lip nearly as long as the sepals, linear-oblong, the upper part recurved, margin slightly wavy, the inner-plate not very conspicuous.

W.A.: Gosnells. September.

P. cucullatum, Reichenbach fil; hooded, referring to the formation of lateral sepals.

A species closely allied to *P. gibbosum,* and considered by Bentham to be perhaps a variety only, but admitted as distinct by Dr. Rogers. A smaller plant with usually a dense, blunt spike, 1 to 1½ in. long, of white and purple sweet-scented flowers, but sometimes single-flowered. The lateral sepals are the shortest segments of the perianth, and are joined at their extreme tips, forming a hood in front of the lip. Upper sepal dark purple at the base, purple stripe down centre. Lip on a long springy claw, at first erect, then bent forwards almost at a right angle.

W.A.: Pinjarra, Porongorups, Ravenswood. September-October.

Caleana, R. Brown

[caley-ann-er]

Named in honour of George Caley, an early collector of New South Wales plants. Sometimes called *Caleyana.*

An Australian genus closely related to *Drakaea,* but readily distinguished from it by the wide wings of the column forming a kind of pouch open or closed by the movements of the irritable lid-like lip, which acts as a trap for insects forced against the column by the spring of the lip. Ovary usually recurved, reversing the flower. Fertilised by struggling insects that are caught and held.

C. nigrita, Lindley; dark.

"LADY'S SLIPPER ORCHID"

A small plant with a radical ovate leaf. Stem about 6 in. high. Flower reversed, usually solitary, reddish-brown to deep purple, on stalk of ½ to 1 in. Segments of the perianth narrow-linear. Lateral sepals incurved and appressed against the dilated wings of the column. Upper sepals incurved and

appressed against the back of the column. Petals narrow at base, then spathulate, appressed against column wings. Lip on a springy claw, lobed. Column yellowish green, wings forming a boat-shaped pouch. Often found associated with *Drakaea elastica.*

W.A.: Boyup Brook, Collie, Maida Vale, Peel Estate.

Spiculæa, Lindley

[spy-cue-lay]

Meaning a little spike

An Australian genus of 3 species separated from *Drakaea* because of diferences in the structure of the column. Eastern States species are known as "Elbow" or "Hammer Orchids." In *Drakaea* the auricles and wings of the column are broadly and bluntly triangular, and are situated near the base of the column. In *Spiculaea* they are actually long-triangular in shape, being placed towards the base of the column.

S. ciliata, Lindley; hairy.

"ELBOW ORCHID"

A small species from 2½ to 5½ in. high. Stem rigid, becoming dark red as the plant dies. The leaf withers when the flower scape is about 1½ in. high. When the flowers begin to open the stem slowly withers from the base upwards, leaving moisture conserved in the upper portion of the plant. Flowers from 2 to 6 in a spike, tan coloured. Dorsal sepal narrow-linear, nearly ½ in. long, concave, glabrous, tip blunt, curved, and pointing downwards; remaining sepals almost thread-like, bent back along pedicel. Lip greenish, movable on a short claw at base of column, and attached to claw by a linear stalk under ½ in. long, concave, hanging vertically downwards; lamina of lip hammer-shaped, tapering to a blunt tip. Lower portion of lamina smooth, with a narrow flesh curved tooth projecting upwards, margins rolled inwards. Upper portion of lip with concave margins fringed with dark glandular hairs, tip dark-coloured, blunt. Column rather shorter than dorsal sepal, curved downwards. Wings narrow, extending downwards from tip of column, U-shaped, ending in thread-like points. Favours dry granite shelves and crevices wet in winter through seepage from higher soil. Often associated with *Borya nitida.*

W.A.: Boya, Bruce Rock, Swan View, York. October-November.

Drakaea, Lindley

[drake-ee-er]

Named in honour of Miss Drake, a botanical artist.

A West Australian genus of plants commonly called "Hammer Orchids," owing to the curious hammer-like appearance and action of the lip, delicately poised on a slender, hinged, stem-like claw. Flowers dull, dark reddish-purple and green, sepals and two petals narrow and inconspicuous. Leaf solitary at, or near, the base of stem.

Fitzgerald disagreed with many botanists regarding the sensitiveness of the lip of *Drakaea* assisting in the fertilisation of the species, except by attraction, and questioned its often asserted power of impelling an insect against the column.

D. elastica, Lindley; springy.

"PRAYING VIRGIN"

Stem, 6 in. high or more, leaf heart-shaped, thick and fleshy, about ½ in. diameter. Flower, solitary. Sepals and petals linear, about ½ in. long, lateral sepals and petals reflexed; dorsal sepal longer and erect. Lip very elastic, top of the basal portion covered with short thick hairs or calli, lower lobe solid and fleshy, half as long as the upper part, upturned at tip. The lower section of the arm on which the lip is supported, is marked with dark and light bands. Favours sandy flats, often found near burnt logs associated with *Caleana nigrita.*

W.A.: Albany, Gosnells, Collie, Jarnadup, Kendenup, Maylands, Margaret River, Pinjarra, York. September-October.

D. Fitzgeraldii, Schlecter; honouring R. D. Fitzgerald.

The following translation from the German of Schlecter's description (Fedde, XVII., 1921, pp. 81) has been kindly supplied by Dr. R. S. Rogers: "This plant has been incorrectly identified with *D. elastica, Lindley,* from which it certainly differs specifically. The leaves are more roundly ovate, and not so distinctly reniform or circular; the stem is generally shorter. The lateral sepals and petals are not directed downwards, but curved forwards and backwards so that they cross one another. The labellum is furnished with warty growths to beyond the middle, and particularly in the middle and along the margins; anteriorly it is distinctly turned upwards with an emarginate apex; the posterior extension of the labellum, which in *D. elastica* is distinctly narrowed in the lower part, is in this species plainly elongate. Likewise the margins of the column are more conspicuously widened than in *D. elastica.*

Locality: District of Perth, flowers September. This species is illustrated under the name of *D. elastica* by Fitzgerald in 'Australian Orchids,' Vol. II., Part I. (1884), plate 4."

D. glyptodon, Fitzgerald; lip resembling a glyptodon.

A species somewhat like *D. elastica,* but differing in the proportions and surface of the lip, the longer lobe being very hairy except at its extreme tip which is smooth but not upturned, shorter lobe glandular but not hairy. The whole lip resembles in form (miniature, of course) the enormous extinct tortoise-monster, glyptodon, a creature as large as an ox and covered with tesselated scales. Favours moist sandy flats.

W.A.: Boyup Brook, Collie, Margaret River, Peel Estate, Pinjarra. October-September.

D. Jeanensis, Rogers; honouring Jean S. Rogers.

Somewhat similar to *D. elastica* and *D. glyptodon.* Leaf emerald-green, radical, orbicular or heart-shaped, glabrous. Stem very slender.

Flowers bright reddish-brown, longer lobe of lip quite smooth except for a few hairs at extreme base near insertion of claw, not glandular, not upturned at tip, shorter lobe very glandular and densely covered with branching hairs.

(Described Transactions and Proceedings Royal Society, S.A., XLIV., 1920.)

Often found associated with *D. glyptodon.*

W.A.: Maida Vale, Pinjarra. October.

Drakaea Jeanensis, Rogers
[Half natural size]

Pterostylis, R. Brown

[terro-style-iss]

From *pteros,* a wing, and *stylos,* a style.

The largest and one of the most interesting genera among Australian orchids. The various species are commonly called

"Greenhoods" because of the shape and colour of the flowers, usually greenish, tinged or streaked with red or brown. The main part of the hood (known botanically as the galea) is formed of the upper sepal and the two lateral petals, lightly attached. The two lower sepals are joined to form a kind of forked door to the front of the hood. The lip usually is irritable, small and tongue-like, with a spur at its base, and is placed inside the joined lower sepals. The long column concealed within the hood is winged, hence the name *Pterostylis*.

The genus includes nearly sixty known species, of which over 40 are Australian, and most of these are endemic. It extends to New Zealand, New Caledonia and New Guinea. Species of *Pterostylis*, owing to the curious formation of the flowers and what one might term their "habits," are of particular interest to botanists and scientists. The genus is mentioned by Darwin in his book on the fertilisation of orchids, as follows:—

> "The flap of the labellum is irritable and hangs out below the hood. If an insect lands on it, it instantly moves up, and imprisons the visitor against the column, and the only mode of escape is by squeezing past the stigma. After half an hour the lip goes down again and is ready for another capture."

This peculiarity is known to most children, who love to touch a sensitive lip and watch its lightning upward spring. *P. vittata*, commonly called "Cockatoo Orchid," a species common in Western Australia, is a favourite for such demonstrations. Fitzgerald's observations upon the genus and individual species, recorded in his work on Australian orchids, are intensely interesting, as are also the published notes of Dr. R. S. Rogers.

Fitzgerald formed the opinion that, in spite of Nature's marvellous schemes to ensure fertilisation of the various species of *Pterostylis*, they are seldom reproduced naturally by seeds, and that the fact of their being found so frequently in groups pointed to reproduction by tubers or leading roots, which may be swept out of the ground by heavy rain-storms, rooted up by animals or ants, and washed or blown away, to vegetate elsewhere. It has been found, however, that many varieties of *Pterostylis* can be cultivated from seed, as well as by transplantation, quite easily, and healthy plants in various stages of development may be found flourishing in the greenhouses of many orchid lovers.

In Mr. O. H. Sargent, Western Australia has an orchid enthusiast who is not only an accomplished botanist, but a keen student of Nature. From him we learn that the flowers of some species of *Pterostylis* contain sticky juices that attract and intoxicate visiting insects, thus compelling them to remain within the

1.—Prasophyllum fimbria.
2.—Thelymitra aristata. *3.—Thelymitra variegata.*
4.—Prasophyllum elatum. *5.—Microtis porrifolia.*
6.—Thelymitra antennifera. *7.—Thelymitra crinita.* *8.—Thelymitra villosa.*
9.—Thelymitra fuscolutea.

flower long enough either to effect fertilisation there, or make sure of pollen being attached to body or wings to be carried on subsequently to another flower.

Two species of the genus in *P. barbata* and *P. turfosa,* the latter endemic to Western Australia and known as the "Bird Orchid," supply a most striking illustration of that characteristic so often quoted as one by which an orchid may be easily recognised —the difference of the third petal or "lip" to the other two and the sepals. No contrast could be greater than the long and slender thread-like protruberance bearded with bristling hairs, to the solid structure of the rest of the flower.

P. nana, R. Brown; stunted.

"SNAIL ORCHID"

A small slender plant. Leaves in a radical rosette, lower stem-leaves heart-shaped, upper ones lanceolate, stem-clasping. Flower over ½ in. long, erect, abruptly curved towards the end. Lower part broadly cuneate, about 1-3 in. long without the linear-subulate lobes, the long points embracing the galea. Lip linear, obtuse, about ¼ in. long. Column half the length of the galea, the wings with a small lanceolate upper lobe or tooth, the lower lobe oblong and obtuse. Favours moist shady places.

W.A.: Albany, Busselton, Highbury, Jarnadup, Mt. Barker. September-October.

New South Wales, South Australia, Tasmania, Victoria.

P. pyramidalis, Lindley; pyramid-like, referring to the foliage growth.

"GNOME ORCHID" "GREEN DEVILS"
"SLY ORCHID"

A species of variable size, sometimes nearly 1 ft. high. Leaves usually crowded at base of stem, passing gradually into stem leaves and scales, but the basal leaves are not always present. Flowers green, similar to *P. nana.* By some botanists this species is not considered distinct from *P. nana,* plants of intermediate form being often found. Dr. Rogers, however, is of the opinion that the two species are distinct.

W.A.: Albany, Gosnells, Jarnadup, Margaret River, Riverton, Stirling Range, York. August-October.

P. reflexa, R. Brown; bent back. (See *P. robusta.*)

P. robusta, Rogers; sturdy.

"SHELL ORCHID"

A slender species, plant without any rosette of ovate radical leaves at time of flowering. Stem leaves lanceolate,

usually four or five including the floral bract. Flower whitish-green with deeper green longitudinal stripes, rather large, single. Galea gradually curved forward at the apex; dorsal sepal with a short slender point, lower lip erect, sepals tapering to thread-like points, embracing and much exceeding the galea. Lip irritable, on a movable claw, practically straight, lanceolate, tapering into a point, in the erect position very slightly exceeding the column. Column erect, the upper angle of the wing acute, the lower lobe oblong-obtuse with inturned ciliated margins. Prefers shady places and favours coastal districts, frequently being found beneath peppermint trees (*Agonis flexuosa*). Note by Dr. Rogers: "Apparently with some hesitation, this plant was included by Bentham in *P. reflexa, R. Brown.* It differs from the latter, however, in its shorter stem, wider leaves, and relatively short, straight labellum which does not protrude through the sinus of the lower lip, as in the sinus of R. Brown's plant."

W.A.: Albany, Ludlow, Margaret River, Swanbourne, York. May-July. All other Australian States.

P. Rogersii, Coleman; honouring Dr. R. S. Rogers, M.A., M.D., F.L.S.

A plant of from 4 to 8 in. in height. Radical leaves not present at time of flowering, stem leaves 4 to 7, lower leaves bract-like. Flower, solitary, translucent white or grey, with red stripes on perianth segments, column and labellum. Galea slightly bent but not abruptly curved. Lower lip erect, sinus acute. Lip on an irritable claw, markedly recurved, protruding through the sinus, lamina tapering to a long obtuse point. Column erect.

(Described "Victorian Naturalist," Vol. XLVI., September, 1929.)

Favours sandy soil.

W.A.: Augusta, Bunbury, Busselton, Collie, Ludlow, Margaret River. June-July.

Pterostylis Rogersii, Coleman
[Half-natural size]

P. constricta, Sargent; contracted.

A small one-flowered species about 3 in. high, first leaves ovate in a radical rosette. Flower stem slender, flexuose,

without radical leaves, but having narrow-lanceolate leaves that increase in length up to ¾ in. towards top of stem. Flower ¾ in. long, bright or bronze green, upper sepal and petals forming hood-like galea. Lateral sepals joined at base and erect in front of galea, the upper portions with a deep V-shaped separation, then tapering into erect points embracing the galea. Lip on a short claw, lanceolate, blunt, edges sharply turned down about two-thirds of the way between base and apex, and just above this constriction, the lip bends abruptly forwards; appendages to the lip densely hairy. (Described Journal Proceedings Royal Society W.A., No. 4, 1907.)

W.A.: Bruce Rock, Narrogin, York. July-August.

P. recurva, Bentham; bent back.

"ANTELOPE ORCHID" "BULL ORCHID"

Stems 1 to 1½ ft. high, rigid, flowers one to three, without radical rosette of leaves, reddish-green, over an inch long. Lip triangular, ending in a rigid point. This species is easily identified by the conspicuously recurved or bent back points of the lower sepals. Grows usually in low scrub.

W.A.: Albany, Bayswater, Busselton, Dumbleyung, Highbury, Kalamunda, Kendenup, King's Park, Perth, Kojonup, Stirling Range, Swanbourne. August-September.

P. turfosa, Lindley; growing in a damp place.

"BIRD ORCHID"

Stem short, slender, one-flowered, leaves linear, all nearly equal and equally distant along the stem. Flower green, mottled and striped, the edge of galea and lower sepals tinged with red. Galea upright, over 1 in. long, with a long point, and much contracted in the middle, thus forming two openings or doorways to the interior of the flower, the lower ostensibly for the entry of insects, and the upper one for their departure only, entry there being prevented by an arrangement consisting of a barricade formed by the crossing of the upper angles of the column wings, further safeguarded by two hairs that are automatically released from the point of the galea when the flower is ready for fertilisation, and cross each other in front of the opening. This device, however, does not hinder the egress of an insect visitor. Lower part of galea linear, with spreading lobes ending in long points. Lip thread-like, bearded with long lateral hairs, and having a clavate point. This orchid has been confused by many collectors

with *P. barbata,* an Eastern States species. Favours moist, shady spots, chiefly loamy clay.

W.A.: Albany, Gooseberry Hill, Jarnadup, Mahogany Creek, Parkerville, Pindalup, Pinjarra, Woogenellup, York. August-October.

P. rufa, R. Brown; reddish.

Stem 6 to 10 in. high with several bracts. Leaves in a radical rosette wither before the flowers are out. Flowers, three to four, often more green than red. Galea nearly ½ in. long, curved, with a long, fine point in front. Lower part on a rather long basal projection of the column and hanging down from it, the sepals terminating in long fine points, variable in length. Lip on a short claw, obtuse. Column reaching to end of galea.

W.A.: Bencubbin, Boyup Brook, Bruce Rock, Wongan Hills, York. October-November.

All other Australian States.

P. Sargentii, Andrews; honouring O. H. Sargent.

Andrews 1905

Pterostylis Sargentii, ~~Rogers~~.
[~~Half natural size~~]

Stem 3 to 5 in. high. Leaves in a radical rosette wither before flowers appear. Lower part ½ in. long, pointing downwards, the lobes ending in very short thread-like points. Stem-leaves or empty bracts lanceolate, stem-clasping. Flowers, 1 or 2. Galea about ½ in. long, curved forward. Upper sepal ending in a short upturned point, lateral petals very shortly pointed, their junction with the upper sepal marked by lines of white hairs inside the galea. Lip on a broad claw, glabrous, three-lobed, the middle lobe triangular, not ¼ in. long, with a ridge down the middle; lateral lobes linear-lanceolate, slightly curved, produced at the base into erect thick club-shaped dark brown appendages. Column nearly as long as the galea, with short almost orbicular wings on either side of the rostellum. (Described Journal W.A. Natural History Society, May, 1905.)

Note by Dr. Andrews: "The labellum and its appendages are quite different from those of any other species and the column wings have no lower lobe. I have not seen the lines of hairs inside the galea in any other species."

W.A.: Bencubbin, Bruce Rock, Dalwallinu, York. July-October.

P. vittata, Lindley; banded.

"BELL ORCHID" "COCKATOO ORCHID"
"HELMET ORCHID"

Often a stout leafy plant from 8 in. to over 1 ft. high. Leaves of seedlings heart-shaped in a flat rosette; in the mature plant, lanceolate, acute, stem-clasping. Flowers, three to seven or more, white, banded with green, or heavily marked with reddish-brown and purple. Galea ½ in. or more long, broad, helmet-shaped, with a short point in front, directed downwards. Lower part broadly ovate; recurved, with two short acuminate lobes. Lip extremely irritable, on a strap-like claw, short, flat, obtuse, tip emarginate. Column bent almost at right angles, broadly winged in the middle. A common species, favouring all soils and situations, excepting wet ground.

W.A.: Widely distributed.
South Australia, Tasmania, Victoria.

Acianthus, R. Brown

[ace-ee-an-thuss, or, ak-ee-an-thuss]

From *akis,* a point, and *anthos,* a flower; referring to the needle-like points of the sepals.

A genus closely related to *Caladenia,* but without calli and fringes on the lip, and differing in the leaf. Another difference hardly apparent with the naked eye, is that the discs attached to the pollen masses are ovate, thick, and connected by a solid arch. In *Caladenia* they are flat, triangular, and separate. Species are fertilised by *crawling* insects, the column being bent forward with the anther screening the stigma from direct approach.

There are about 18 species of *Acianthus,* mostly occurring in New Caledonia. One comes from New Zealand, and five are Australian.

A. exsertus, R. Brown; projecting.

"MOSQUITO ORCHID"

A slender, delicate plant under 6 in. high. Leaf heart-shaped, red underneath. Flowers small, three to six, pink,

upper sepal incurved, concave, ¼ in. long, lateral sepals awl-shaped; petals lanceolate, half as long as sepals. Lip as long as sepals, oblong-lanceolate. Column slender, not winged, half as long as sepals, protruding forward from the dorsal sepal.

W.A.: Listed as occurring, but no record of specimens or localities available.

All other Australian States.

Cyrtostylis, R. Brown

[sir- or kir-toe-style-iss]

From *kyrtos,* curved, and *stylos,* a column.

A small genus of two species, one occurring in Australia and one in New Zealand, closely allied to *Caladenia,* but more like *Acianthus* in habit, and included in this genus by some botanists. Wholly dependent on insects for fertilisation. Seed-capsules few in proportion to flowers.

C. reniformis, R. Brown; kidney-shaped.

"MOSQUITO ORCHID"

A small delicate plant. Leaf heart or kidney-shaped, radical, up to 1½ in. diameter. Stem from under 2 in. high and one-flowered, to 6 or 7 in., with four or five pale red flowers. Dorsal sepal somewhat long, triangular-shaped, lateral sepals and petals narrow. Lip as long as dorsal sepal and correspondingly wide. Favours moist, shady places.

W.A.: Albany, Cottesloe, Greenbushes, Margaret River, Stirling Range, York. August-November.

Calochilus, R. Brown

[kale-o-kye-luss]

From *kalos,* beautiful, and *cheilos,* a lip; referring to the fringed labellum.

An Australian genus of glabrous plants with one long narrow leaf, and, usually, two or three erect leaf-like, sheathing bracts on the stem. Flowers few, in a terminal raceme, with a large lip densely fringed. The column resembles that of *Thelymitra,* and the genus, apparently, is self-fertilised.

C. Robertsonii, Bentham; honouring J. G. Robertson, a Victorian botanist.

A stout species up to 1½ ft. in height, leaf rather long. Flowers three to five, sepals and petals acuminate, petals

longer than sepals. Lip deep prune-coloured, fringed all over. Column-wings with a more or less distinct gland on each side in front, connected at base.

Though listed as West Australian by F. von Mueller and included in an official census of West Australian plants, this orchid is either extremely rare in Western Australia, or has been missed by present-day collectors.

New South Wales, South Australia.

Eriochilus, R. Brown

[air-ee-o-kyle-uss]

From *erios,* wool, and *cheilos,* a lip; referring to the hairy or woolly surface of lip.

A genus closely allied to *Caladenia,* principally represented in Western Australia, but occurring also in New South Wales, Queensland, South Australia and Tasmania. Usually hairy plants, with leaf solitary at the base of, or higher up, the stem. Flowers, one or more, pink and white. Lateral sepals longer than the erect upper one. Lip shorter. Species are commonly "Parson's Bands" or "Donkey's Ears." Fertilised by insects and producing seed more freely than most orchids not self-fertilised.

E. scaber, Lindley; rough.

Slender plants under 6 or 8 in., sometimes growing in groups of a dozen or more. Leaf radical, ovate or heart-shaped. Flowers, one to three. Lip with small erect lateral lobes, middle one nearly orbicular. Favours loamy flats.

W.A.: Albany, Bayswater, Busselton, Guildford, Highbury, Jarnadup, Margaret River, Mundijong, Parkerville, Riverton, York. July-September.

E. tenuis, Lindley; slender.

A very slender species, stem glabrous, 3 to 6 in. high. Single-flowered. Leaf radical, narrow.

W.A.: Guildford. May. Chester Pass, Stirling Range. September.

E. dilatatus, Lindley; broad.

Stem above 6 in. Leaf at or below the middle of stem, linear-lanceolate, sessile and stem-clasping. Flowers usually one, two or three. Middle lobe of lip ovate-oblong. Mr. O. H. Sargent records having found this orchid in the York district in various soils in April and May, and that specimens

with four or five flowers are common there, also that one was collected in 1905 with 13 flowers.

W.A.: Albany, Bunbury, Kalamunda, King's Park, Perth, Swan View, York. April-June.

E. multiflorus, Lindley; many-flowered.

A species with the habit and foliage of *E. dilatatus,* but often over 1 ft. high. Flowers smaller, white, more numerous, sometimes over 10 in a spike or raceme. Middle lobe of lip narrow-oblong. Favours gravelly slopes and is often found on burnt country when the shrubs have only a few leaves showing.

W.A.: Margaret River. April.

Lyperanthus, R. Brown

[lie-per-an-thuss]

From *lyperos,* mournful, and *anthos,* a flower; referring to the sombre appearance of the best known species, *L. nigricans,* when dried.

A genus of about 12 species closely allied to *Caladenia* and extending to New Zealand and New Caledonia. Stems two or more-flowered, either with one radical leaf, or two or three almost leaf-like empty bracts, or with about two stem-leaves. The flowers, which have the appearance of coarse spider orchids, are produced from sheathing bracts, and have the upper sepal broad and hooded.

Fitzgerald considered *Lyperanthus* an unsatisfactory intermediate genus, stating that it was "erroneously described by Bentham as producing small underground tubers, whereas the roots of *L. nigricans* are clustered, thick and fleshy."

L. nigricans, R. Brown; black.

"POTATO ORCHID" "RATTLE ORCHID"

Stem from a few inches to 1 ft. high, leaf radical, ovate, 1 to 2 in. long, thick and fleshy. Flowers, two to five, white, striped with deep crimson, rarely pure white, enclosed by sheathing bracts; upper sepal broad and much incurved, lower ones and petals long, linear, curving gracefully. Lip shorter, margins fringed. Column incurved, not winged, the circular peltate stigma very prominent. The plants do not always produce flowers, and Fitzgerald's note on this subject is interesting: "This species only flowers after fires have passed. Where a fire had been, every plant produced a flower-stem. Near

by, where the fire had not reached them, leaves of plants were numerous, but not a single flower or bud."

W.A.: Boyup Brook, Busselton, Darling Range, Highbury, Pindalup, Ravenswood, Stirling Range. August-October.

L. serratus, Lindley; toothed. (*Caladenia serrata, Reichenbach.*)

A stout plant over 1ft. high. Leaf broadly linear, often over 1ft. long. Flowers 4 to 6, pale green, shaded to yellow, streaked and suffused with crimson, bracts acuminate, over 1in. long. Upper sepal lanceolate, incurved, concave, ½in. or more long, lateral sepals shortly acuminate. Lateral petals narrower and longer. Middle lobe of lip recurved and brush-like at the tip with crowded calli.

W.A.: Busselton, Gosnells, Jarnadup, Kojonup, Pinjarra, York. September-October.

L. Forrestii, F. von Mueller; named in honour of Lord Forrest.

Leaves three, at or near the base of the stem, the lowest ovate-lanceolate, with a solitary small narrow-lanceolate leaf or bract near the middle of the stem. Flowers white with pink shading and deep crimson markings and dots, two or four, on rather long and slender stalklets, bracts rather large; perianth segments about equal, lateral sepals spreading, obfalcate, the bases very attenuated; dorsal sepal erect, much wider, concave, lateral petals falcate-lanceolate. Lip almost obovate with a long attenuated base, erect in lower half, margins scalloped but not fringed, nearly ½in. long, dotted all over with minute calli. Column very narrowly winged.

This orchid was originally collected near the Stirling Range by the late Lord Forrest.

Extract from Dr. Rogers' notes accompanying detailed and supplementary description (Transactions and Proceedings Royal Society S.A., XLIV. 1920): "The leaves of this rare plant were identified in situ at Lake Chockerup. Some young plants were removed by Dr. A. Syme Johnson and cultivated in Albany, where they bloomed about the middle of November the same year. An opportunity was thus afforded to examine the plant in a living state and so supplement the original description of F. von Mueller 'from the few dried and much shrivelled specimens hitherto secured.'"

Leptoceras, Lindley

[lep-toss-er-ass]

From *leptos,* slender, and *ceros,* a horn.

Glabrous plants. Leaf short, broad and smooth. Sepals acute or rather obtuse, the upper one erect or incurved, con-

cave, petals erect, linear-clavate (club-shaped), longer than the sepals. Note by Dr. Rogers: "The one species in this genus is closely allied to *Caladenia Menziesii* and the genus *Eriochilus,* which have been included under *Leptoceras* by some botanists. On the other hand the single member of the genus is commonly placed under *Caladenia* by taxonomists and is so included by Bentham."

L. fimbriatum, Lindley; fringed. (*Coladenia fimbriata, Reichenbach, Eriochilus fimbriatus, F. von Mueller.*)

"HARE ORCHID" "FLY ORCHID"

Stems 6in. to 1ft. high. Leaf (occasionally two) clasping stem close to ground, about 1 in. long, ovate lanecolate or oblong. Flowers usually two or three, purple and green. Petals erect, longer than the sepals, clavate. Lip very broad, lobed, fringed at the end, the disk without calli.

W.A.: Greenmount, Highbury, Kalamunda, Midland Junction, South Perth, York. May-August.

South Australia, Victoria.

Note by Fitzgerald: "Leaves much more frequently observed than flowers. It is with great reluctance I depart from the naming in 'Flora Australiensis,' but I cannot concur with the inclusion of this with *Caladenia*, and have placed it in Lindley's *Leptoceras* for the following reasons: Leaf or leaves not those of *Caladenia.* In *Caladenia* I have never seen more than one leaf, always thin and usually hairy; in this plant leaf thick, hard and shining, occasionally two. In *Caladenia* tubers are generally numerous, in *L. fimbriata* I have only observed one. The labellum is without the characteristic glands and is not of the form obtaining in *Caladenia,* the stigma is very different in form being triangular and deep sunk, the upper parts overhanging, not oval and shallow; and the flowers have the peculiarity of drying and continuing in a state hardly to be distinguished from the fresh flowers long after the seed has been shed. It approaches *C. Menziesii* only (so far as I can see) in having erect linear-clavate petals, in which *C. Menziesii* is itself peculiar. *L. fimbriata* seems to come nearer to *Eriochilus* than to *Caladenia,* but differs from it again."

Caladenia, R. Brown

[kal-a-dean-ee-er]

From *kalos,* beautiful, and *adenos,* a gland, referring to the glands on the lip, and the great beauty of the species generally.

A large genus of hairy plants, with several species in New Zealand, and between 60 and 70 endemic to Australia, and chiefly represented in Western Australia. *Caladenia* species are readily distinguished by the rows of calli or glandular hairs upon the lip. Leaf solitary, linear-lanceolate or oblong. Flowers solitary or very few in a loose raceme, variously coloured. Dorsal sepal usually erect, or incurved over the column, while the lateral petals and the other two sepals are somewhat flat and spreading. The length and shape of the petals and sepals vary considerably in the different species, which are divided into easily defined sections. Species with long tapering sepals and petals are known as "Spider Orchids," and greatly admired for their dainty, fragile loveliness. Nature has been kind to Western Australia, as in addition to the number of beautiful species of *Caladenia* she possesses, most of them have been distributed with a lavish hand.

Botanists have differed regarding the classification of some species of *Caladenia* and closely allied genera, which have been placed in various lists claiming to be authoritative, under different names. This is confusing to beginners and necessitates endless explanation.

After Western Australia, Victoria is the Australian State most favoured with *Caladenias,* having 20 species, which, with the exception of five (including *Caladenia Patersonii,* found in all the States), are different to West Australian varieties. New Zealand has several species of *Caladenia,* New South Wales has 17, Queensland 5, South Australia 18, and Tasmania 12, and the genus is represented in New Caledonia and the Malay Archipelago. The Australian species are all endemic, with the exception of *C. carnea,* which is recorded from Java.

C. Menziesii, R. Brown; honouring Archibald Menzies, naval surgeon and botanical collector.

"BUNNY ORCHID" "RABBIT ORCHID"

Stems slender, 6 to 9 in. Leaf ovate-lanceolate, usually 1 or 2 in. long, sometimes 7 in. long and 2 in. broad. Flowers white and pink, one or two on long stalks, lateral sepals lanceolate, acute, nearly ½ in. long, upper sepal concave and incurved. Petals much longer than the sepals, erect, narrow-linear, clavate, giving the flower a two-horned appearance. Lip undivided, ovate, erect at base, recurved towards the end, calli more or less distinctly arranged in two or four rows. Favours moist, shady places.

W.A.: Widely distributed. September-October.
Tasmania, South Australia, Victoria.

C. fimbriata, R. Brown; fringed. (See *Leptoceras fimbriatum.*)

C. discoidea, Lindley; disc-like or round, referring to the shape of lip.

"ANTELOPE ORCHID" "BEE ORCHID"
"STAG'S HEAD ORCHID"

Stem 1 ft. or more. Leaf broadly linear or lanceolate, 6 in. or more long. Flowers often two or three, yellowish-green tinged with crimson. Sepals ½ in. or more long, shortly acuminate, upper sepal narrow, erect, incurved and concave, lateral sepals lanceolate, somewhat falcate, spreading, petals longer and narrower. Lip not much shorter than sepals, broadly ovate, veined, undivided, fringed, very shortly contracted at the base, calli irregularly crowded, the lower ones often longer and club-shaped, the two lowest conspicuously so. Column narrow and incurved at base, broadly winged in upper half, with two red glands at the base, which gleam within the flower like the eyes of insects. Grows usually in loose sandy soil.

W.A.: Bullsbrook, Cape Leeuwin, Collie, Darlington, Pingelly, Pinjarra, Wagin, York. September-October.

C. Cairnsiana, F. von Mueller; honouring the Rev. Adam Cairns, of Melbourne.

"ZEBRA ORCHID"

Stem about 6 in. Leaf linear. Flower solitary pink shaded, sepals and petals narrow-linear, about ½ in. long, not produced into points, appressed against the ovary; lip erect against the column, as long as sepals, on a very short claw, elegantly veined with deep reddish-purple divergent lines, margins entire, calli crowded in two rows. Column narrow, much curved at the base, broadly winged upwards. Favours loamy soil.

W.A.: Boyup Brook, Kojonup, Mount Barker, Pingelly, Porongorups, Stirling Range, York. September-October.

C. multiclavia, Reichenbach; much clubbed, referring to the club-shaped calli.

Stem 6 in. to 1 ft. Leaf short and very hairy. Flower, usually one, sometimes two, greenish-yellow, sepals and petals streaked with red, about 1 in. long; lateral petals lanceolate-falcate, spreading, the inflated portion some-

Caladenia multiclavia, Reichenbach
[Half natural size]

hat exceeding the point; upper sepal retracted at base, then ncurved, sharply falcate, with long fine rigid point, narrower than lateral sepals. Lateral petals lanceolate-falcate, wider than dorsal sepal, not quite so wide as lateral sepals, lightly adhered to the margin of the upper sepal from the stigmatic wing of the column almost to their tips, giving to the column a hooded appearance and making it look very wide. Lip-ovate-rhomboid on a rather long and slender claw, generally vertical, slightly re- out the middle; dark red clavate calli collected of claw and central portion of base of lip. ed horizontally almost at right angles then in- very large, bluntly and widely falco-triangular. easily distinguished by the horizontal position epals with points turned upwards, by the nod- lternate yellow and dark red bands, and by the red calli placed on a fleshy cushion on lip. " (*Acacia acuminata*) country.

ndee, Datatine, Highbury, Katanning, Pingelly. ber.

ld; net-like, referring to the veining of

"VEINED CALADENIA"

arge, usually solitary, rarely two, yellow, shaded with red. Sepals usually clavate, lateral petals ding. Lip on a distinct claw, curiously veined ss fashion, ovate, slightly toothed. Calli, shaped ub, in four-six rows. Column retracted at base, t and incurved, widely winged.

yup Brook, Gilgerring, Woogenellup. September.
South Australia, Victoria.

C. filamentosa, R. Brown; thread-like, referring to the tips of sepals and petals.

"BLOOD SPIDER ORCHID" **"YELLOW SPIDER ORCHID"**

Leaf narrow-linear. Flowers usually red, sometimes yellow, or with red perianth and white lip veined with crimson; sepals and petals narrower than in *C. Patersonii*. Calli with flat oblong tops, always in two rows only on the basal half of the lip. Often found growing in groups with the root tubers entangled, and as many as 40 flower stems bunched lightly together with charming effect. Favours loamy clay soil.

W.A.: Widely distributed. August-September.
New South Wales, South Australia, Tasmania, Victoria.

C. Dorrienii, Domin; honouring Capt. A. A. Dorrien-Smith, D.S.O.

C. discoidea, Lindley; disc-like or round, referring to the of lip.

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"STAG'S HEAD ORCHID"

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C. Cairnsiana, F. von Mueller; hono Cairns, of Melbourne.

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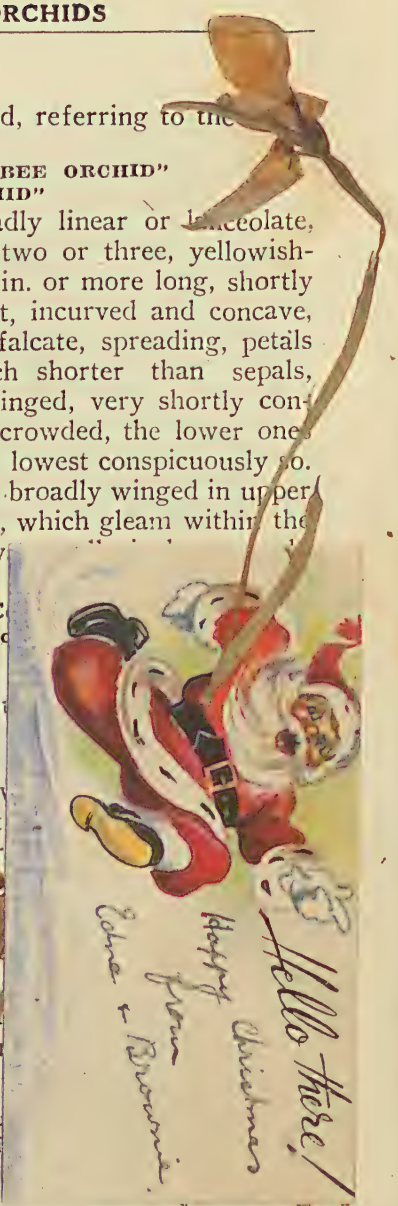
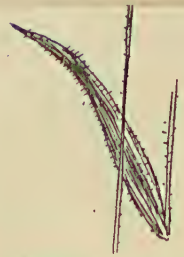
W.A.: Boyup Brook, Kojonup, Mou Barker, Pingelly, Porongorups, Stirli Range, York. September-October.



C. multiclavia, Reichenbach; much clubbed, referring to the club-shaped calli.

Stem 6 in. to 1 ft. Leaf short and very hairy. Flower, usually one, sometimes two, greenish-yellow, sepals and petals streaked with red, about 1 in. long; lateral petals lanceolate-falcate, spreading, the inflated portion some-



Caladenia multiclavia, Reichenbach
[Half natural size]

what exceeding the point; upper sepal retracted at base, then incurved, sharply falcate, with long fine rigid point, narrower than lateral sepals. Lateral petals lanceolate-falcate, wider than dorsal sepal, not quite so wide as lateral sepals, lightly adhered to the margin of the upper sepal from the stigmatic wing of the column almost to their tips, giving to the column a hooded appearance and making it look very wide. Lip-ovate-rhomboid on a rather long and slender claw, generally vertical, slightly recurved from about the middle; dark red clavate calli collected on upper part of claw and central portion of base of lip. Column retracted horizontally almost at right angles then incurved, wings very large, bluntly and widely falco-triangular. This orchid is easily distinguished by the horizontal position of petals and sepals with points turned upwards, by the nodding lip with alternate yellow and dark red bands, and by the numerous dark red calli placed on a fleshy cushion on lip. Favours "Jam" (*Acacia acuminata*) country.

W.A.: Baandee, Datatine, Highbury, Katanning, Pingelly. September-October.

C. reticulata, Fitzgerald; net-like, referring to the veining of the lip.

"VEINED CALADENIA"

Flowers large, usually solitary, rarely two, yellow, shaded and streaked with red. Sepals usually clavate, lateral petals shorter, spreading. Lip on a distinct claw, curiously veined in a criss-cross fashion, ovate, slightly toothed. Calli, shaped like a golf-club, in four-six rows. Column retracted at base, therefore erect and incurved, widely winged.

W.A.: Boyup Brook, Gilgerring, Woogenellup. September.
South Australia, Victoria.

C. filamentosa, R. Brown; thread-like, referring to the tips of sepals and petals.

"BLOOD SPIDER ORCHID" "YELLOW SPIDER ORCHID"

Leaf narrow-linear. Flowers usually red, sometimes yellow, or with red perianth and white lip veined with crimson; sepals and petals narrower than in *C. Patersonii*. Calli with flat oblong tops, always in two rows only on the basal half of the lip. Often found growing in groups with the root tubers entangled, and as many as 40 flower stems bunched lightly together with charming effect. Favours loamy clay soil.

W.A.: Widely distributed. August-September.
New South Wales, South Australia, Tasmania, Victoria.

C. Dorrienii, Domin; honouring Capt. A. A. Dorrien-Smith, D.S.O.

A slender graceful plant. Stem about 6 in., with one narrow-linear leaf of same length, and having a short linear spreading bract about the middle. Flower solitary, base of peduncle sheathing, about 1 in. long, dark coloured. Sepals and petals 1 in. or more long, narrow-lanceolate-linear, three-veined, thin, glabrous, with dark-coloured, thread-like, elongated tips densely glandular-villose. Lip nearly an inch long, middle part provided with a few obtuse teeth. Calli in two series, each consisting of seven or eight calli placed closely against the middle of the lip.

W.A.: Kojonup. October.

C. tentaculata, Tate; with tentacles, referring to the long and slender perianth segments.

A species not considered sufficiently distinct by Dr. Rogers, to be classed as other than merely one of the many forms of *C. filamentosa*. Mr. Sargent reports this orchid as being common in various soils in the York district in August and September, and that two varieties occur there—one with sepals and petals yellow. In the other they vary from pale to deep crimson and the parts are pendulous. (See Journal Natural History Society, W.A.).

C. Patersonii, R. Brown; honouring Col. W. Paterson, Lieut.-Governor of New South Wales and Tasmania.

"SPIDER ORCHID

Stems 1 to 2 ft. high. Leaf linear-lanceolate. Flowers usually white, or yellowish-white with reddish-brown stripes down the centre of the perianth segments. Sepals and petals spreading, except dorsal sepal, which is upright, more or less dilated in the lower part, but not clavate, tapering to long points. Lip usually with purple or crimson tip and calli, ovate-lanceolate on a short claw, undivided, the basal half erect, with acutely toothed margins, tip acute, recurved, calli rarely extending beyond the bend, linear-golf-stick in type, in 4-6 rows. Column incurved, winged narrowly in lower part, widely above. Not common and range limited. Favours moist clayey patches.

W.A.: Highbury, Kojonup, Pindalup. October.
All other Australian States.

Bentham, working from dried specimens, without having seen the flowers in a fresh state, was unable to separate several, to him, doubtfully distinct forms of *C. Patersonii,* including *C. filamentosa, C. longicauda,* and *C. dilatata.*

Variety longicauda, Rogers; long-tailed.

"WHITE SPIDER ORCHID"

Flowers white and pink, with very long dusky tentacles, which are covered with glandular hairs. The lip is not typical in shape. It is ovate-oblong, with the apex usually very obtuse. The lateral margins have long graceful combings about as far as the middle, thereafter the margins are serrate to the apex; calli linear, in four to six rows. Favours light or loamy soil.

W.A. Widely distributed and common. September-October.

Orchid-hunters acquainted only with Eastern States specimens of *Caladenia Patersonii,* invariably are amazed at the development of this West Australian variety. Stems are frequently over 2 ft. 6 in. high. The outstretched tentacles (often dilated again towards the end) sometimes measure 12 in. across, and some plants bear as many as five perfect blossoms. It has been pointed out by Dr. Rogers that natural hybridism is responsible for a great deal of confusion with filamentous *Caladenias.* These often are linked by intermediate forms and pass imperfectly from one into the other.

C. pectinata, Rogers; toothed like a comb.

"RED-LIPPED SPIDER ORCHID"

A tall handsome species. Flowers yellowish, with dark red markings on perianth segments and lip. Dorsal sepal erect or slightly incurved, with clavate point, lateral sepals spreading, with clavate points. Lateral petals spreading or reflexed backwards, shorter than sepals. Lip on a short claw, margins deeply toothed with a comb-like fringe. Calli in four rows, increasing to 6-8 rows near the apex of lip.

W.A.: Widely distributed. September-October.

C. lobata, Fitzgerald; lobed, referring to the column wings.

"BUTTERFLY ORCHID"

A tall robust species, considered by Fitzgerald to be the most beautiful of the *Caladenias.* Leaf oblong-lanceolate, sheathing at the base, over 1 in. wide. Flowers, one or two, pale greenish-yellow, shaded, streaked and spotted with crimson. Petals linear, tapering to a long point. Sepals dilated for about an inch, then passing into long fine points. Upper sepal erect and much curved forward, lateral sepals sharply curved upward. Lip three-lobed, 1 in. or more wide, lateral lobes elegantly fringed; calli of the disk linear, crowded for about one-third of the lip in two bands which unite into one at the base. Column with no glands at the base, wings dilated into an ear-like lobe about the centre. The lip of this magnificent orchid swings lightly on a narrow claw, and has the

appearance of a butterfly poised upon the flower, its wings trembling and vibrating in the breeze.

W.A.: Bluff Knoll, Stirling Range, Upper Kalgan River. September-October.

C. dilatata, R. Brown; widened, referring to the broad lip.

"GREEN ORCHID"

A handsome species. Flowers yellowish-green, shaded and streaked with crimson, but sometimes without any red on perianth or lip. Lateral sepals turned upwards almost at right angles. Lip three-lobed, the middle lobe in typical specimens deep crimson, curving back with a horn-like appearance, and the wide-spreading lateral lobes usually fringed. Calli crimson, long, slender, club-shaped, closely packed in the centre of the disk in four rows. The lip moves freely on a hinge-like claw. Column winged, with two distinct glandular calli at the base. Favours clayey soil.

W.A.: Albany, Cape Leeuwin, Greenbushes, Katanning, Kojonup, Perth, Stirling Range, Wagin, York. September-November.
New South Wales, South Australia, Tasmania, Victoria.

Var. rhomboidiformis, Coleman; rhomboid in form, referring to lip.

A slender early-flowering variety resembling *C. dilatata* in colour, but with shorter, broader perianth segments; lateral sepals pendant, neither crossed, spreading or deflexed. Lip rhomboidal, without the wide green lateral lobes and combs of the type, dilated portion shortly fringed, toothed towards the apex. Calli thick and fleshy. (Described "Victorian Naturalist," February, 1930.)

W.A.: Augusta, Boyup Brook, Busselton, Capel, Forest Grove, Mundaring, Waterloo. September-October.

C. radialis, Rogers; radial, referring to lip markings.

A graceful species from 6 in. high. Flowers, one or two, rather large, yellow and reddish-brown, with dark lines on the perianth segments and lip. Segments lanceolate and dilated at the base, narrowing to shortly hairy thread-like tails, marked with reddish-brown lines. Dorsal sepal erect, incurved, three-nerved. Lateral sepals and petals a little longer, 3-5 nerved, spreading. Lip on a slender movable claw, somewhat ovate, much recurved at apex, margins usually entire, rarely slightly serrate, lamina decorated with dark radial nerves. Calli yellow, linear-golf-stick type, densely crowded in six rows on the lower part of lip, ending about the middle of the lamina. Column erect, incurved, winged throughout,

but widely so just below the anther. (Described Transactions Royal Society S.A., Vol. LI., 1927.)

W.A.: Beverley, Dowerin. September.

Note by Dr. Rogers: "This species replaces the plant in Western Australia hitherto regarded as conspecific with *C. clavigera, Cunningham.* Its lip differs considerably from that of the Eastern species, not only in shape, but also in the presence of the six rows of densely crowded calli and a number of dark radial lines. Its column is also quite differently winged, has a very blunt anther without a mucrone, and is without the usual double yellow calli at the base. The segments of the perianth are not clavate."

C. bicolor, Rogers; two-coloured.

A species about 8 in. high, rather closely approaching *C. radialis,* but differing in the relatively shorter petals, and in the presence of two oval calli at the base of the column. Flower solitary, rather large, yellowish, with reddish-brown stripes and markings. Dorsal sepal erect, incurved, linear, with conspicuous reddish-brown line on lower half, then contracted into a terete tail covered with dense, short reddish-brown glandular-tipped hairs. Lateral petals similar but rather longer, spreading. Petals lanceolate, retroflexed, otherwise similar to sepals. Lip on a very slender claw, ovate, at first erect against the column, then recurved to an obtuse tip; margins dark reddish-brown, entire except near the apex where they are very shortly sinuate, lamina longitudinally concave, basal half yellow with conspicuous reddish-brown divergent stripes, the recurved apex part dark reddish-brown and bare. Calli linear, with fleshy heads, golf-stick type, arranged rather indefinitely in six rows extending to about the middle. Column erect, with hatchet-shaped wings on either side of the stigma, and more narrowly below. (Described Transactions Royal Society S.A., Vol. LIV., 1930.)

W.A.: Swan River district, Muresk. September.

C. clavigera, Cunningham; club-bearing, referring to the clubbed tips of sepals.

"CLUBBED SPIDER ORCHID"

A species with the habit of *C. Patersonii.* Sepals usually about 1 in. long, lanceolate at base with long fine points usually, but not always, clavate at the tips, petals shorter but not clavate. Lip under ½ in. long, the broad yellow lateral lobes quite entire, the purple middle lobe either entire or

slightly scalloped towards the base, calli in about four rows. (See *C. radialis.*)

W.A.: Albany, Beverley, Tukurua. September-October. New South Wales, South Australia, Tasmania, Victoria.

C. longiclavata, Coleman; long-clubbed.

A robust species from 6 in. high. Leaf lancelolate. Flowers, one or two, maroon and yellow, perianth segments slightly spreading, except the dorsal sepal, which is erect and incurved, with wide red central stripes; sepals and petals longly and heavily clavate for more than one-third of their length. Lip ovate, yellowish, apex and calli maroon, not tremulous, lateral margins shortly fringed, toothed towards the much recurved apex. Calli in four rows, rarely six. Column incurved, widely winged above, much narrower below. (Described "Victorian Naturalist," February, 1930.)

W.A.: Boyup Brook, Busselton, Capel, Donnybrook, Forest Grove. September-October.

C. plicata, Fitzgerald; folded, referring to the folded tip of labellum.

"CRAB-LIPPED ORCHID"

Stem about 1 ft. high. Leaf lanceolate, 7 or 8 in. long, about $\frac{1}{4}$ in. broad, sheathing at the base. Flowers usually two, almost horizontal, yellowish streaked with red. Petals narrow-lanceolate, sepals lanceolate at the base for about half their length, then narrow-linear, clavate. Upper sepal erect, recurved. Lip crab-shaped, nearly $\frac{1}{2}$ in. wide, fringed, on a long slender claw, with the same trembling movement as in *C. lobata.* Calli of the disk dark crimson, linear, clavate, crowded into a band down the centre of the lip. Column winged from the base, with two oval-shaped calli near the base.

W.A.: Lake Chockerup, Mt. Barker, Porongorups, Tukurua. September-October.

C. cristata, Rogers; crested, referring to calli arrangement.

A slender plant about 1 ft. high, leaf linear, about 4 in. long. Flower solitary, segments of perianth yellowish-green, with a central red streak; sepals nearly 1 in. long, upper sepal erect, incurved lanceolate. Lateral sepals wider, acuminate; spreading, lateral petals linear-lanceolate, narrower and shorter than the sepals. Lip reddish-brown, veined, mobile on a short claw, heart-shaped, edge rolled under a little and entire, calli on long stalks, crowded into a conspicuous, rather narrow, dense crest along the centre, extending from the claw

almost to the apex, bi-lobed near the claw, and more or less linear near the apex. Column almost equal in length to lip, much incurved and very widely winged in the upper half. This species resembles *C. plicata, Fitzgerald,* in the shape of its column and the arrangement of its calli, but differs in the absence of the clubbed sepals and fringed lip margins. Type specimen collected on an alluvial flat, near a creek, 20 miles south of Pithara, by Dr. E. S. Simpson, of Perth, a keen orchidologist. Specimens were plentiful. (Described Transactions Royal Society S.A., XLVII., 1923.)

W.A.: Pithara. September.

C. macrostylis, Fitzgerald; large style.

Caladenia macrostylis, Fitzgerald
[Half-natural size]

A slender species from a few inches to 8 in. high. Leaf linear-lanceolate, sheathing at base, 4 to 5 in. long. Flowers, one or two, pale yellow streaked and veined with red. Sepals and petals lanceolate, tapering to a short clavate point. Lip on a short claw, ovate-lanceolate, veined, the dark red edges thickened with glandular denticulations on the margins of the apex. Calli dark reddish-brown in a broad band extending from near the base of lip almost to the point, clavate, closely packed. Column nearly ½ in. long, wide, much bent and very broadly winged from the base to half way up the anther. Found in loam, laterite, or forest country. Fitzgerald found this orchid on the edge of a swamp near the Upper Hay River in September.

Dr. Rogers' note regarding its situation is as follows: "This orchid chooses the most barren of ironstone country on which to grow. On the Upper Kalgan a few specimens occupied a small area of ground shunned by every other living plant. At Mount Barker it was quite numerous amid scrub almost equally inhospitable."

W.A.: Albany, Boyup Brook, Busselton, Collie, Highbury, Jarnadup, Kelmscott, Mt. Barker, Pindalup. September-December.

C. Drummondii, Bentham; honouring James Drummond, an early West Australian pioneer, botanist and collector.

A small species, leaf ovate-lanceolate, ½ in. by ¼ in. Flower solitary on a stalk of 2 to 3 in. Sepals and petals resembling *C. hirta* (which has white, pink-shaded flowers),

about ½ in. long, including the dark-coloured point, about as long as the whitish dilated part. Lip with lateral lobes broadly rounded, entire, recurved, calli in about 4 rows.

Bentham states that without much character in the flower this species differs from the whole genus in the shape of the leaf. It is either very rare, or easily overlooked, as its collection is unrecorded since first found by Drummond in the Swan River district many years ago, when the specimens were forwarded to England. Its discovery would be hailed with delight by present-day collectors.

W.A.: Swan River district.

C. triangularis, Rogers; triangular.

A species with the habit of *C. Patersonii,* about 9 in. high. Flower solitary, cream-coloured, with reddish-brown lines. Dorsal sepal erect with three reddish longitudinal lines dilated below, contracting gradually into a moderately short glandular point as in *C. hirta;* lateral sepals similar to dorsal sepal, but wider and rather longer, spreading.

Petals with one red longitudinal line. Lip clawed, ovate-triangular in outline, lateral lobes rather deeply combed, middle lobe triangular, shortly fringed or dentate, lamina with radiating red lines at the base. Calli lamina orange, in 2 rows, not extending beyond the middle. Column curved, more or less erect, widely winged above, more narrowly below. (Described Transactions Royal Society S.A., Vol. LI., 1927.)

W.A.: Highbury. September.

C. hirta, Lindley; hairy.

A very hairy species, 1 ft. high or more. Leaf oblong or lanceolate, 2 to 4 in. long. Flowers two or three, white, shaded with pink. Sepals and petals ¾ to 1 in. long, irregularly acuminate, points much shorter than in *C. Patersonii.* Lip sessile, broad and undivided, more or less fringed from the middle upwards, recurved. Calli in four-six regular rows. Favours chiefly loam or laterite.

W.A.: Albany, Darlington, Narrogin, Stirling Range, Toodyay. August-October.

C. lavandulaceae, Rogers; like lavender.

A very slender species with the habit of *C. Roei,* but differing in the segments of the perianth, in the conspicuous veining of the lip and in the calli on the disk; up to 10 in. high. Flowers lavender, conspicuously marked with radiating

lavender lines; all segments of the perianth with conspicuously clavate dark glandular tips, lavender in colour, traversed by darker longitudinal lines, lanceolate, subequal in length and similar in shape. Dorsal sepal retracted backwards, the other segments spreading. Lip mobile, very slenderly clawed, almost transversely oval in outline, with entire margins, large rounded lateral lobes, middle lobe relatively small, blunt, dark purple, recurved; lamina with conspicuous radiating dark lavender veins. Calli dark purple, fleshy, stalked, compactly crowded. Column at first retracted, then incurved, widely winged in the upper half. Leaf narrow-linear, acute, hairy, channeled, between 4 and 5 in. long. (Described Transactions Royal Society S.A., Vol. LI., 1927). Favours sandy loam and usually found associated with marri gum (*Eucalyptus calophylla*).

W.A.: Highbury, Narrogin, York. September.

C. Roei, Bentham; honouring J. S. Roe, first Surveyor-General of Western Australia.

"ANT ORCHID"

Stem 6 to 8 in. Leaf narrow-linear. Flower solitary, greenish-yellow. Sepals and petals about ½ in. long, points much shorter than the dilated part. Lip on a distinct claw, ½ in. or more wide, lateral lobes light-coloured, broad, not fringed, middle lobe smaller, recurved, fringed with short calli. One or more large calli between the lateral lobes at the top of the claw, and small crowded sessile ones usually along the centre of the disk.

W.A.: Cootarring, Dumbleyung, Gnowangerup, Highbury, Katanning, Narrogin, Wagin. September-October.

Caladenia Roei, Bentham
[Half natural size]

C. Bryceana, Rogers; honouring Miss Bryce MacIntyre.

A tiny plant, under 2 in. in height, closely related to *C. Roei*. Flower solitary, rather less than ½ in. long; upper sepal hairy, spathulate, incurved, about same length as lateral sepals, but wider. Lip freely movable on a rather long claw, with wide green lateral lobes, middle lobe (tip) short, blunt, triangular, studded with reddish-purple glands, recurved and then reduplicated. Calli dark reddish-brown, standing up conspicuously in four dense rows nearly to the tip. On the

claw near the base of the disk, is a large purplish-green clavate bi-lobed projection. Column much incurved, with large hatchet-shaped wings. No yellow glands at base of column. (Described Transactions Royal Society S.A., Vol. XXXVIII., 1914.)

W.A.: Gnowangerup. September.

C. Doutchae, Sargent; honouring Miss L. Doutch.

A species varying in height from 4 in. to 1 ft., stem slightly hairy, leaf linear-lanceolate, from 3 to 4 in. long. Flower solitary, green with purple stripes. Dorsal sepal erect, lanceolate, acuminate. Lateral sepals lanceolate, caudate, margins revolute. Petals decurved, linear and lanceolate, margins revolute, tips acuminate. Lip broadly elliptical, margin entire, middle lobe small, oblong, obtuse, reflexed. Calli short, thin, clavate in two or three rows. Column incurved, glands at base dark purple. (Described "Journal of Botany," Vol. 59, June, 1921). Note by Mr. O. H. Sargent: "This new species closely resembles *C. Roei,* from which it is readily distinguished by its delicately caudate sepals and purple-veined labellum with extremely small and slender calli."

W.A.: Datatine. September.

C. barbarossae, Reichenbach; red-bearded.

"ANT ORCHID"

Stem 6 to 10 in. Leaf narrow-oblong or lanceolate, about 2 in. long. Flower solitary, greenish-yellow, streaked and shaded with reddish-purple. Lip on a long claw, lateral lobes linear-falcate and erect; one long club-shaped callus at the top of the claw and two short linear ones, with two lines of small calli on the middle lobe.

W.A.: Bridgetown, Boyup Brook, Perth, Woogenellup, York. September-November.

C. flava, R. Brown; yellow.

"BUTTER ORCHID" "COWSLIP ORCHID"

Leaf lanceolate, rather long for the plant. Flowers two to five, usually yellow, but sometimes pink, and in intermediate forms, white speckled with magenta. Sepals and petals broadly lanceolate, acute, contracted at the base, lateral sepals often above 1 in. long, upper sepal smaller, with more or less distinct reddish lines or blotches along the centre. Lip $\frac{1}{4}$ in. or more long and broad, with a very short concave claw, deeply three-lobed, lateral lobes ovate, middle lobe longer and lanceolate, bordered on each side by several long calli. Calli

of the disk in two rows almost in a semi-circle. Column winged from base. Usually found around burnt trees, particularly marri gum.

W.A.: Widely distributed and common. August-September.

C. paniculata, Fitzgerald; bearing flowers in panicles.

A small species, leaf oblong-lanceolate, 2 or 3 in. long. Flowers three to six, in a flat panicle, white and pink, sepals and petals narrow, lanceolate, about 1-3 in. long. Lip shorter, three-lobed, the central lobe lanceolate, fringed with club-shaped calli, lateral lobes large and erect; calli of the disk about 20, linear, in two rows, united by a long central callus extending from the short claw two-thirds of the length of the lip. Column winged from the base. Favours sandy or loamy soil, often clustered at base of gum trees.

W.A.: Armadale, Balbarrup, Gosnells, Karridale, Pinjarra, Ravenswood, Swan View. September-October.

Caladenia paniculata, Fitzgerald
[Half natural size]

C. Purdieana, Andrews; honouring Alexander Purdie, M.A.

A slender species 8 in. high or less. Leaf lanceolate, 2 or 3 in. long, nearly ½ in. wide in the upper part. Flowers, pink, usually two or three, sepals and petals nearly equal and spreading, about ½ in. long, lanceolate, acute, petals rather narrower than sepals, white and glabrous above, more or less covered with rusty brown hairs below. Lip on a claw with a narrow longitudinal plate, three-lobed, at first entire, then bordered by two rows of thick divergent calli, no central callus as in *C. paniculata*, which this species resembles, upper part of the recurved middle lobe fringed with shorter calli, the end with a sinuate margin; lateral lobes shorter, erect, broad, obtuse and entire. Column short, incurved, very narrowly winged. (Described Journal Proceedings Mueller Botanical Society, 1902.)

W.A.: Albany, Bullsbrook, Kelmscott, Midland Junction, Pinjarra. October-November.

C. unita, Fitzgerald; united, referring to the sepals.

Stem from 3 in. to 1 ft. high. Leaf linear-lanceolate, from 3 to 6 in. long. Flowers pinkish-mauve, hairy on the outside, two or three on long or short stalks. Petals lanceolate, acute, contracted towards the base. Lower sepals lanceolate-falcate, united for nearly two-thirds of their length. Lip about ¼ in. long on a long claw, ovate, much recurved and fringed with linear calli. Column winged to the base, wings produced into oblong lobes on each side of the stigma.

W.A.: Albany, Boyup Brook, Busselton, Darling Range, Greenbushes, Manjimup, Pindalup, Stirling Range. September-October.

C. latifolia, R. Brown; wide leaf.

"PINK FAIRIES"

Stem 6 in. to 1 ft. high. Leaf oblong or lanceolate, 1½ in. to 4 in. long. Flowers pink or white, usually two or three. Lateral sepals sometimes 1 in. long, oblong-lanceolate, obtuse, upper sepal shorter and more acute, petals shorter and more lanceolate. Lip deeply three-lobed, fringed near the base with a few marginal calli, the long calli of the disk linear, club-shaped, in two short rows, more or less converging in a semi-circle. Column shortly and rather broadly winged at the apex. With this species Bentham united *C. marginata, Lindley,* and *C. ochreata, Lindley.* Favours limestone hills.

W.A.: Albany, Bridgetown, City Beach, Perth, Darlington, Harvey, Jarnadup, Kojonup, Weld River, Yallingup. October-December.

All other Australian States.

C. reptans, Lindley; creeping.

A small one-flowered species closely resembling *C. latifolia,* considered by Bentham to be perhaps a variety, and not distinctive from *C. Preissii, Reichenbach.* Middle lobe of lip not recurved, calli more or less united, arranged in two converging rows across the disk. Dr. Rogers' comment on this orchid is that it must be extremely rare and seldom collected. The doctor has been unable to secure a specimen.

W.A.: Mahogany Creek (Fitzgerald), Darling Range, and Blackwood River (Diels). August.

C. nana, Endlicher; stunted.

A little pink orchid considered by some botanists identical with *C. reptans.* Dr. L. Diels has expressed the opinion that it is distinct. (Journal Proceedings, Mueller Botanical Society, April, 1903).

W.A.: Albany district.

C. tenuis, Fitzgerald; slender.

A very slender species from 5 to 20 in. high. Leaf lanceolate, sheathing at the base, from 3 to 5 in. Flowers one to three, petals and sepals white, with a pink stripe down the centre, light brown towards the end, the colour produced by closely-set sessile calli. Petals linear, acute. Sepals broader than petals and a little longer. Dorsal sepal erect. Lip about five lines long, narrow-lanceolate without lobes, point reflexed. Calli of the disk linear in two bands of four rows each, the point of the lip without calli on the surface but edged with linear calli. Column about five lines, very slightly bent, winged from the base, anther with rather a long point.

W.A.: Champion Bay. August.

C. carnea, R. Brown; flesh-coloured; var. alba, Bentham, white.

A species found in all the Eastern States, but only recorded comparatively recently in Western Australia. Typical specimens have been collected by Mr. Sargent in the York district, with odourless flowers, sepals and petals rusty-grey outside, glistening white inside. Dr. Andrews in a note accompanying his description of *C. Purdieana* (Journal Proceedings, Mueller Botanical Society, December, 1903), states that his species bear considerable resemblance to *C. carnea, var. alba,* in general appearance, though the leaf is much broader, the dorsal sepal less erect, and the tuft of erect calli, appearing near the base of the claw of the lip in *C. carnea, var. alba,* is absent.

W.A.: York. September.

All other Australian States.

C. saccharata, Reichenbach; sweet.

"DWARF WHITE ORCHID"

A species somewhat resembling *C. carnea.* A small plant about 3 in. high, leaf narrow-linear. Flower small, white, lateral sepals spreading, broader than the lateral petals, dorsal sepal erect or incurved. Lateral lobes of lip somewhat falcate, middle lobe linear-lanceolate, entire, yellow. Calli yellow, club-shaped, closely packed in two very yellow rows, extending almost to apex of middle lobe. Column purple, incurved. Often associated with tea-tree scrub, mallet bark and she-oak.

W.A.: Bencubbin, Dumbleyung, Highbury, Mt. Barker, York. September.

C. aphylla, Bentham; without leaves.

Stems almost thread-like, glabrous, 1 to 1½ ft. No leaf at all at time of flowering. Flower solitary, whitish or pale

yellow, sepals and petals narrow-lanceolate, tapering at the base, ¾ to 1 in. long, upper sepal erect and concave. Lip 3-lobed, more than half as long as the sepals, contracted into a claw, lateral lobes falcate, middle lobe long and tipped with yellow, calli linear, club-shaped, in two rows. Column slightly winged.

W.A.: Albany, Hay River, Kalgan River, Tukurua, Yallingup. April.

C. deformis, R. Brown; deformed.

Early flowering specimens rarely above 6 in. high. Flower solitary, light blue or pale mauve, sepals and petals over ½ in. long, lanceolate, obtuse, contracted towards the base, upper sepal more erect than the others and concave. Lip with an erect, linear claw, ovate, obscurely lobed, calli numerous and crowded. Late-flowering specimens of this orchid have been observed in flower on plants up to 18 in. high. A common species.

W.A.: Widely distributed. June-September.

C. sericea, Lindley; silky-haired.

"MOUSE ORCHID"

Stems 6 in. to 1 ft. high. Leaf lanceolate, often rather broad, 1 to 3 in. long. Flowers one or two, blue, much incurved in the bud. Sepals and petals nearly equal, ¾ to 1 in. long, oblong-lanceolate. Lip wedge-shaped, equally 3-lobed, middle lobe recurved, shortly fringed with a few calli. Calli of disk in about four rows. Found in all classes of soil.

W.A.: Albany, Highbury, Kalamunda, Kendenup, Margaret River, Parkerville, Pindalup, Pinjarra, Stirling Range, Waroona. July-October.

C. gemmata, Lindley; gem-like.

From 6 to 8 in. high when 1-flowered, taller when 2-flowered. Leaf ovate, 1in. long, usually dark brown beneath. Flower large, deep blue, rarely white; sepals and petals about ¾ in. long, obtuse. Lip broadly ovate, undivided, erect at the base, recurved at the end and obtuse. Column the length of the lip, narrowly winged. Usually found in loamy clay or laterite. A common species.

W.A.: Widely distributed. August-October.

C. pellita, Endlicher. Not considered distinct from C. gemmata by Bentham.

C. Gertrudae, Ostenfeld.

(Described Ostenfeld's Contributions to W. A. Botany, Pt. 3, Copenhagen, 1921), has been joined to *C. Gemmata* by Dr. Rogers. Note by Ostenfeld: "This little known orchid resembles *C. gemmata* but differs in the colour of the flowers, the almost acute petals and sepals, and having the lip longer than the column. Collected Yallingup, September."

C. ixioides, Lindley; like Ixia.

This is possibly a variety of *C. gemmata,* which it closely resembles in habit, but the flowers are yellow, with the lip not so broad, sharp-pointed, sometimes obscurely 3-lobed, and the calli more prominent, almost linear.

W.A.: Upper Swan, Subiaco. September.

Glossodia, R. Brown

[gloss-o-dee-er]

From *glossa,* a tongue, and *oidos,* like; referring to the tongue-like appendage within the flowers.

An Australian genus of five species. Usually hairy plants. Leaf solitary, oblong or lanceolate. Flowers one or two. Sepals and petals obtuse, nearly equal, spreading. This genus is closely allied to Caladenia, differing in the absence of calli on the surface of the lip, but having at its base calli-like appendages, distinct and large in West Australian species. It is divided into two sections, which might easily be considered distinct genera—one, peculiar to the Eastern States only, having one bifid (or cleft) appendage at the base of the column; the other, endemic to Western Australia, with two basal appendages to the column. West Australian species are known as "Enamel," "Wax," or "China Orchids," because of the shining appearance of the waxy upper surface of the flowers which are heavily spotted on the under side.

G. Brunonis, Endlicher; honouring Robert Brown.

"PURPLE ENAMEL ORCHID"

Stem 6 in. to 1 ft. Leaf narrow-lanceolate, 1 to 3 in. long. Flowers, one, two, or three, upper surface purple, shining, under surface whitish, purple spotted. Sepals and petals $\frac{1}{2}$ to $\frac{3}{4}$ in. long, spreading. Lip inconspicuous, white, pointed and abruptly recurved at tip, shorter than the column, lanceolate or linear. Column half as long as sepals, with a broad wing

produced from behind the anther into a concave hood, and two prominent calli at base. Favours sandy soil among jarrah trees. A common species.

W.A.: Widely distributed. August-December.

G. intermedia, Fitzgerald; intermediate.

Stem slender, five or six. Leaf oblong, 2 or 3 in. long. Flowers lilac-purple, solitary, sepals and petals about ½ in. long ovate-lanceolate, blunt, glossy. Lip about 1-3 in. long, linear, obtuse, twice duplicate towards the end, not emarginate (notched) with two enlargements towards the end, column winged from the base to above the anther. Note by Fitzgerald: "The flowers of this species resemble *G. Brunonis,* but it flowers later, and the lip and calli at the base are more like *G. emarginata.* Column narrower than in either." Seldom collected.

W.A.: Swan View. September.

G. emarginata, Lindley; emarginate.

"PINK ENAMEL ORCHID"

A beautiful species with large rose-pink flowers, spotted underneath, more frequently 1-flowered than *G. Brunonis.* Lip red, tip U-shaped, with three longitudinal ridges, often exceeding the hooded column in length, reduplicate. Calli-like appendages at its base as long as lip, orange-yellow tipped with purple. A common species.

W.A.: Widely distributed. August-December.

Corysanthes, R. Brown

[kor-ee-san-thees]

From *korys,* a helmet, and *anthos,* a flower

Dwarf plants with a single heart-shaped leaf, frosted in appearance below. Flowers large in proportion to size of plants, solitary, somewhat trumpet-mouthed. The lip is curiously fringed with bristle-like auricles or spurs which no doubt assist in snaring insects, for fertilisation purposes, that may visit the flower in search of honey. Fitzgerald has recorded that "the various species are capable of self-fertilisation aided by insects, but seed is seldom produced and the plants multiply by their roots and bulbs apparently. Individual plants, though several inches apart, are often united, but only one plant so joined is ever found in flower, and the connection probably lasts only one season." The genus is extensive, ranging from the Philippines, the Himalayas, through the islands to Papua, Polynesia, New Zealand and Australia. There are five Australian species.

C. pruinosa, Cunningham; frosty.

A tiny plant, rarely 2 in. high, including the flower. Leaf heart-shaped, 1 in. in diameter. Flower reddish-purple. Lip erect against the upper sepal, nearly ½ in. long. The stalk grows from 1½ in. to 6 in. after the formation of a seed-capsule, perhaps for the better distribution of the seed. If not fertilised, the flower perishes on the leaf.

W.A.: Big Brook, Albany District. June-August.

A specimen of *Corysanthes* was found in June, 1921, at Big Brook, near Pemberton, in the "karri" country, growing on the trunk of "Blackboy" (*Xanthorrhoea Preissii*). It puzzled the finder, who thought it might be an epiphyte and sent it to Mr. W. Catton Grasby for identification. The collection of *Corysanthes* has been but seldom recorded in Western Australia, and this "find" was considered of particular interest, reproduction from seed being proved, undoubtedly, because of the situation. *C. fimbriata, R. Brown,* and *C. pruinosa, Cunningham,* are doubtfully distinct species, and frequently grow intermingled in the Eastern States, where they are found occasionally growing in abundance on the trunks of tree ferns. They flower in winter and early spring. A description of *C. fimbriata, R. Brown,* is appended: Plant small, leaf round, cordate, pointed. Flower reddish-purple, almost sessile. Dorsal sepal erect, then incurved, gradually contracted to a claw, lamina forming a hood over and beyond the lip. Lateral sepals colourless, linear, connate at their bases with each other and with the petals. Petals somewhat wider and shorter, colourless, often bidentate. Lip large, sessile, deep crimson, lower half vertical against the dorsal sepal, enclosing the column in a split tube; upper part acutely recurved, expanding into an orifice with denticulate margins and directed forward. Tube at base dilated at each side of attachment into a wide auricle. Column short, not winged.

The orifice of lip of *C. pruinosa* is not fimbriate, or scarcely so, usually having entire incurved margins.

Cryptostylis, R. Brown

[krypt-o-style-iss]

From *kryptos,* concealed, and *stylos,* a column.

A genus closely allied to *Calochilus,* but without the fringed lip. Flowers reversed, apparently wholly dependent on insects for pollination. There are 18 known species of *Cryptostylis,* four of these are endemic to Australia. The others are found in Formosa, Malay, Papua, Philippines, New Caledonia, Fiji, and Samoa.

Interesting observations concerning the pollination of the genus have been made by Mrs. Edith Coleman, Mr. O. H. Sargent and Lt.-Colonel B. T. Goadby. In a paper contributed to "The Victorian Naturalist" (Vol. XLIV., May, 1927), Mrs. Coleman described the visits of Ichneumon-flies (*Lissopimpla semipunctata, Kirby*) to *Cryptostylis leptochila* (an Eastern States species). It was definitely established that this insect visits this particular orchid purposely, enters the flowers backwards instead of in the usual manner of nectar-seeking wasps, and successfully effects pollination. The following is a quotation from Mrs. Coleman's paper:

> "After backing into the stigma, the end of the wasp's body took an inward falcate curve, and the base of the flower's labellum appeared to be gripped by the claspers. This curve of the end, brought the abdomen just in position for the upper-surface, at about the second last ring, to rest on the flower's prominent rostellum, with its dark-coloured disk. The insect quivered for a moment, and then became motionless. After a second or two, it freed itself, with an apparent effort which shook the flower. Resistance could be plainly felt when we withdrew the insect with our fingers. In every instance, when we gave it time enough, the effort was sufficient to release the pollinia, which, with the viscid disc, were carried off by the insect on the tip of its abdomen, never on any other part of the body. Owing, no doubt, to this resistance, pollen was frequently deposited on the stigma of the same flower, and more was probably carried to the stigma of the next flowers visited. Some of the insects bore pollen before they entered our flowers, while others took away more than they brought. It took at least a second to complete the act, and if we disturbed the wasp too soon, no pollen was abstracted."

In an article published in "The Journal of Botany," April, 1929, Mrs. Coleman states:

> "Only males visit the orchids, in circumstances that leave no room for doubt that they are stimulated by sex-instincts, and enter the flowers under the misapprehension that these are females of their kind. . . . . The shape and colour of the labellum suggest the body of the female wasp, the glistening glands corresponding with the brilliant white spots on the abdomen of the insect. The narrow sepals and petals probably suggest the antennae, ovipositor, and guides. . . . . The female wasp has never been seen near the orchids, yet one may expose a few spikes in a locality where they are not known to occur, and in a few minutes they are visited by the male insect. . . . Apart from the resemblance of the flowers to the female wasps it is fairly certain that their perfume,

though almost imperceptible to us, is conveyed to the male wasps over quite long distances. . . . . The case is not so singular as was at first supposed, for observation of several other Australian orchids points clearly to similar partnerships."

In an accompanying note, Colonel M. J. Godfrey comments upon Mrs. Coleman's observations, as follows:

". . . . Dr. R. S. Rogers, the leading authority on the Australian *Orchidaceae,* has never seen a hybrid in the genus *Cryptostylis.* In this respect it resembles the North African *Ophrys speculum,* which is solely visited by *Dielis ciliata* (Journ. Bot., 1925, p. 34). The removal of the pollinia on the end of the insect's abdomen is exactly parallel with the case of *Ophrys fusca* and *O. lutea,* in which the species of *Andrena* concerned assume the same reversed position. Some doubt has been expressed as to whether the resemblance of the lip of the flower to the female *Lissopimpla is* sufficient to deceive the male. It seems to be agreed that the vision of insects is very inferior to ours. But so long as one or two salient points are suggested, exact resemblance to the insect concerned is unnecessary. The metallic blue centre of the lip and its fringe of red hair in *Ophrys speculum* are quite enough to convince the male *Dielis ciliata* that he sees the sheen of blue wings and the red-fringed abdomen of his long-looked-for mate. The shadowy and indefinite markings on the lip of *O. fusca* and *O. lutea* (which only suggest an insect to us when viewed from a distance) are quite enough to persuade an *Andrena* that he has found what he wants. In her second paper in the "Victorian Naturalist," 1928, p. 334, Mrs. Coleman says: 'A glance at the strange labellum . . . . with its double row of dark glistening glands that gleam in the hot sunshine . . . . is perhaps sufficient to justify the theory of an attraction based on the resemblance of the flower to a female wasp. Even to our eyes the likeness is apparent. To the inferior eyesight of the insect the resemblance may be still more convincing.' Further, in all the above cases, insects are attracted to the flowers from a distance, showing that by the emission of scent or of some other attractive agency, the flowers are able to convey knowledge of their existence. That the appeal is not to the desire for food, but to the strong sexual urge of the male, was sufficiently evident in the case of certain species of *Ophrys,* and is confirmed in a remarkable manner by Mrs. Coleman's discovery that the sexual claspers of the male actually became engaged with the base of the labellum, so that resistance can be felt when the insect is pulled away."

In another paper ("The Victorian Naturalist," Vol. XLVI., July, 1929), Mrs. Coleman described similar pollination methods by the same insects on *Cryptostylis subulata* and *C. erecta.* It was found that a faded specimen of the only West Australian species of *Cryptostylis* (*C. ovata*) held a very great attraction for the ichneumons, which hovered about it, and made many attempts to enter the limp, travel-worn bloom. Mrs. Coleman's theory is that the absence of hybrids where different species are found growing intermingled may be due to the fact that anther and stigma in various species mature at different periods, and that pollen from one species is incapable of fertilising another. ("The Victorian Naturalist," April, 1930.) Further experiments, however, are being made by Mrs. Coleman.

Observations made by Colonel Goadby and Mr. O. H. Sargent prove that cultivated plants of *Cryptostylis ovata* are fertilised by the same fly in similar fashion, as recorded by an article entitled "Wildflower Nuptials," by Mr. Sargent in "The West Australian" on December 14, 1929, and in a paper by Mrs. Coleman in "The Victorian Naturalist," February, 1930.

C. ovata, R. Brown; oval, referring to the leaf.

"DINGY ORCHID"

Stem 1 to 2 ft. Leaves radical, ovate to oblong, 3 to 6 in. long. Flowers several in a terminal raceme, brownish-green, with a prominent fleshy lip about 1 in. or more long, and the column completely enclosed by its short broad base. Sepals and petals narrow-linear-lanceolate. The flowers are very dingy in appearance. This orchid is found among tangled growth in damp, shady spots of coastal forests of the extreme South-West and on sandy flats among paper-bark trees in the Jarrahdale district.

W.A.: Albany, Jarnadup, Jarrahdale, Porongorups. February-October.

Gastrodia, R. Brown

[gas-trow-dee-eer]

From *gaster,* a stomach, referring to the inflated appearance of the flowers.

Leafless herbs parasitical on roots, having several flowers in a terminal raceme on erect stalks, simple, with loosely sheathing scales. The genus extends to New Zealand, Malay Archipelago, Formosa and Japan.

1.—Lyperanthus nigricans, *2.—Lyperanthus serratus.*
3.—Pterostylis recurva. *4.—Diurus carinata* *5.—Drakaea elastica.*
6.—Pterostylis turfosa. *7.—Glossodia emarginata* *8.—Glossodia Brunonis.*
9.—Caladenia Menziesii. *10.—Leptoceras fimbriatum*
11.—Eriochilus scaber. *12.—Diuris longifolia.* *13.—Pterostylis robusta*
14.—Pterostylis vittata.

G. sesamoides, R. Brown; sesamum-like.

An inconspicuous leafless plant, stems from 1 to 1½ ft. Flowers tubular, white, yellowish-brown at base, perianth ½ in. or more long, lobes short and broad.

W.A.: Jarnadup. December.

New South Wales, Queensland, Tasmania, Victoria.

Rhizanthella, Rogers

[riz-an-thel-ler]

Terrestrial saprophytic herbs, unique in Australia, possibly entirely subterranean. Rhizomes short, thickened, without roots, branching. Inflorescences erect, subsessile, solitary, terminal; those on the smaller lateral rhizomes with well developed bracteate stems. Flower-heads surrounded by rather large ovate bracts.

R. Gardneri, Rogers; after C. A. Gardner.

Rhizanthella Gardneri, Rogers.
[Natural size]

Flower-heads up to 2 in. in diameter, cup-like, bracts whitish, ovate or oblong-lanceolate, up to 2 in. long, over-lapping. Flowers numerous, small, sessile, dark purple, crowded. Sepals and petals erect, dorsal sepal hooded, lateral sepals very fleshy, widely triangular. Petals oblong-falcate, acute, membraneous, slightly shorter and much narrower than the sepals, forming a galea with the dorsal sepal. Lip reddish, attached to the apex of column-foot by a delicate movable claw, tongue-like, very large in comparison to size of flower. Column erect. (Described Journal Royal Society W.A., Vol. XV., October, 1928.)

W.A.: Corrigin, Shackleton, Goomalling. May-June.

The discovery of this orchid at Corrigin by Mr. John Trott, when cultivating virgin soil previously rolled and burned, aroused interest among Australian orchidologists. Note by Dr. Rogers, to whom specimens were forwarded for identification:

"A superficial examination of the single capitulum which first reached me, suggested that it belonged to a member of the Glomerinae, a group of orchids chiefly restricted to the Malaysian and Papuasian areas. Further examination, however, showed that there were tribal differences, and that like so many Australian orchids, the new plant was neottious in character. It had indeed distinct affinities with the Gastrodiinae, a subtribe in which it is now usual to include *Gastrodia, R. Br., Didymoplexis, Griff., Leucolena, Ridl.,* and *Auxopas, Scltr.* The first two genera are represented in our own flora, the others are respectively endemic to the Malay Peninsula and Cameroons. Of these four, it is undoubtedly the most closely related to *Gastrodia, R. Br.* From this, however, it differs in the remarkable inflorescence of numerous sessile flowers, united by their ovaries and crowded together in a bracteate capitulum; also in its unwinged column, and in its stigma which is situated on the face of the column near the apex, and not at the base as in *Gastrodia,* and likewise by its slenderly clawed, very movable and exceedingly fleshy labellum. Some of these differences appear to be of sufficient importance to warrant its exclusion from the *Gastrodiinae.* I must therefore regard it as the type of a new sub-tribe, belonging to the *Polychondreae.* The records, as shown by the material available, indicate extreme stress of environment followed by the most abject plant poverty and degradation."

FIELD NOTES.

FIELD NOTES.

FIELD NOTES.

FIELD NOTES.

FIELD NOTES.

(For W.A. orchids)
W.R. Randell ("GEUM" of Western Mail) c/o Mail, Perth. W.A.

FIELD NOTES.

GLOSSARY

Acuminate, tapering to a point.
Anther, the part of a flower containing pollen.
Awned, bristly or bearded.
Basal, relating to or forming the base of any part of a flower or leaf.
Bract, a leaf usually smaller than the true leaves of a plant, from which a flower-stalk arises, or any modified leaf or scale on a flower-stalk or at the base of a flower.
Calli, glandular hairs or appendages.
Capsule, the ovary, or that part of an orchid below the column where the seed is formed.
Channeled, grooved.
Cilia, hair-like formations, usually marginal, forming a fringe.
Clavate, club-shaped, growing gradually thicker.
Claw, the slender stem-like formation sometimes present at the base of the petals or lip of an orchid.
Column, that part of an orchid formed by the union of the stamens and pistil.
Concave, hollow and curved or rounded.
Connate, united.
Cucullate, hooded.
Cuneate, wedge-shaped, with the point at the base.
Deciduous, falling off at a certain stage of growth.
Denticulate, notched in small tooth-like projections.
Dilated, expanding, or widening into lateral wing-like appendages.
Disk, the whole surface of a part.
Dorsal, upper.
Elliptical, oblong with rounded ends.
Emarginate, with the margin notched.
Entire, applied to a part not having its margin indented.
Epiphyte, a plant that grows on other plants without deriving nourishment from them.
Falcate, bent like a sickle.
Fertilisation, the process by which in flowers the pollen causes the rudiment of a seed to become fertile or reproductive.
Flexuose, having alternate curves in opposite directions.
Galea, the upper or helmet-shaped part of certain flowers.
Glabrous, having a smooth, shining surface without hairs.
Glandular, having a small prominence or gland.
Labellum, the lower petal of an orchid flower, often of a curious shape, commonly called the lip.
Lamina, the blade of a leaf, or the broad expanded portion of a petal or sepal.
Lanceolate, rather narrow and tapering to a point at the top and sometimes at the base also.
Lateral, of or pertaining to the side of any part of a plant.
Linear, narrow, same breadth throughout.
Lip, see Labellum.
Lobe, a rounded projection or division of a leaf or petal.
Mucrone, a small, sharp point.
Orbicular, having a circular outline.

Ovary, that part below the column of an orchid containing the rudimentary seeds.
Ovate, oval, egg-shaped.
Panicle, a pyramid-shaped form of flower-cluster.
Pedicel, a stalk supporting one flower or fruit.
Peduncle, the stalk of a flower-cluster.
Peltate, having the stem or support attached to the lower surface instead of the base or margin.
Perianth, of an orchid flower, the sepals and petals.
Petal, one of the inner leaves of a flower.
Pistil, the part of the flower that produces seed, consisting of an ovary and a stigma which is commonly raised on an elongated portion called the style.
Pollen, the mass of grain contained in the anther.
Pubescent, covered with fine, short hairs.
Raceme, a flower-cluster with an elongated axis or central stem.
Radical, proceeding directly from the root.
Reduplicate, redoubled.
Reflexed, bent back.
Rostellum, a small button-like projection on the column of an orchid.
Saccate, pouched.
Saprophytic, feeding or growing upon decayed animal or vegetable matter.
Scale, a small appendage like a rudimentary leaf.
Sessile, without a claw or stem.
Simple, without subdivisions, entire.
Sinuate, having the margin alternately curved inward and outward.
Sinus, a depression between adjoining lobes.
Spatulate, shaped like a spatula or battledore, rounded, with a long, narrow-linear base.
Style, see pistil.
Subulate, awl-shaped.
Terrestrial, existing on or in the earth.
Truncate, abruptly terminating as though cut off at one end.
Tubercle, a small knob-like prominence.
Undulate, wavy.
Villose, covered with fine hairs.
Wing, the semi-transparent expansion usually produced on each side of the column of an orchid.

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Brooktown Bot Walpole & Manjimup (Near)

D. carinata
C. Pat. var longicauda
C. filamentosa
C. Pectinata
C. unita
C. semmata
C. flava
Pr. ovale

Lyp nigricans plenty

Pr. fimbria Repum Velez
Pr. hians elatior + var mueller
C. flava
C. Pectinata
Pr. cucullata subbosum
C. latipila + Olivata
Th. fascicularis longicornis
Em. scabra
C. fericea abundant
Pr. parvipetalum
Pt. v. Hella mueller
Pt. rotunda
C. unita
Th. arenaria
Th. ranciflora
C. unicarinata

Pt. alantoidea
Pr. gibbosum
Cal. integra (135 sp.)
Cal. sigmoidea
Th. fascicalata
Cal Saccharata
Cal Cairnsiana
Thel. villosa
Microtis sp. nov
Pras. sp. nov
Lyper. sp. nov
Caladenia sp. nov
Cal. plicata